

VEGETATION MANAGEMENT PLAN
NEZ PERCE NATIONAL HISTORICAL PARK
AND
BIG HOLE NATIONAL BATTLEFIELD



2002

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and
BIG HOLE NATIONAL BATTLEFIELD

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INTRODUCTION AND BACKGROUND

The first recorded interactions of whites with the Nez Perce Indians took place early in the development of the Northwest. The tribe freely ranged from the Cascades to the Rockies. In 1855, a treaty was negotiated with the Nez Perce establishing a 5,000 square mile reservation as their land. In 1860, however, this treaty was changed by the encroachment of gold prospectors on tribal homelands. The conflicts between the angered Nez Perce and the settlers led to government intervention to cope with the crisis. In 1863, the government engaged the Nez Perce in another treaty council that resulted in some of the tribal bands leaving the talks in anger. The government was actually trying to get some of the bands to cede most or all of their lands. To the Indians, no one had the right to sell the land. Those who refused and left became known as the non-treaty Nez Perce.

For years, non-treaty bands continued to live on the homeland of Chief Joseph's Band, the Wallowa country of northeastern Oregon. Growing conflicts with whites led the Army to order the non-treaty bands onto the Nez Perce reservation with the agency headquarters at Lapwai, Idaho. Bitter from the years of mistreatment, a few young warriors struck out and killed some whites to avenge the murders of some tribal members. The flight of the Nez Perce began on June 17, 1877. The route they took in their long, desperate attempt to escape the Army is now a national historical trail. The Nez Perce National Historical Trail extends 1,170 miles from Wallowa Lake, Oregon through Idaho, the edge of Wyoming and into northern Montana. The terrain along the trail is very diverse: from mountain forest to dry prairie, crossing rivers and spanning four states.

Thirty-eight historical sites have been established along the 1,170-mile trail, and the National Park Service manages these sites. Each site has its own unique story as well as its own vegetation to be managed. The diversity of the sites is the reason that each should be managed individually. Although similar areas of concern can be found at many sites, each site should be addressed separately due to differing vegetation and the environments affecting its plants.

Currently, the National Park Service has only a general management plan that serves as a loose guide for managing all thirty-eight sites of the Nez Perce National Historical Park (NEPE). A more site-specific guide is needed to help site managers solve individual vegetation management problems that are not addressed in the general plan.

This vegetation management plan addresses the following:

- Assessment of vegetation composition. This information will aid in identification of invasive species and documenting the presence of native species. Identification of the plants will also allow the appropriate form of weed control and vegetation management to be used. A vegetation management area map is provided for each site.
- Outline of soil types. Soil identification will aid in the control of erosion and plant establishment as well as management of native species that are appropriate. A soil survey map is provided for most sites.
- Documents concerns for hazard trees. Trees that present a serious risk to site visitors, staff, and historic structures are hazardous and should be removed, pruned or replaced when possible.

- Outline of scheduled routine landscape maintenance. Scheduled grounds maintenance, such as mowing and weed removal, will provide optimum growing conditions for native species as well as other desired species.

The policy of the National Park Service (National Park Service 2000) mandates that native species be preserved and used for re-planting whenever possible. Good management practices begin with a clear, concise plan that addresses individual site needs. This plan follows the policies and regulations of the National Park Service and provides site managers with guidelines to preserve and protect the resources for the benefit of the park and the visitors.

This vegetation management plan includes a description of seven select sites (Canoe Camp, Heart of the Monster, Spalding, White Bird Battlefield, Bear Paw Battlefield, Big Hole National Battlefield, and Old Chief Joseph Grave Site), their vegetation composition, general vegetation maintenance, as well as problem areas and guidelines to deal with them. Lists of plants present at each site, including noxious species, are included at the end of each section. Native species are recommended for revegetation where needed, and steps are described to restore the landscape at each site to its natural setting as much as possible. This plan will provide site managers with information needed to maintain sites with regard to the historic significance and natural beauty of the landscape. Areas of focus are the actual plant communities at the site, including invasive species that need to be controlled and native species of significance that should be encouraged. Implementing this management plan will provide the visitors to the sites with a more natural and aesthetically pleasing experience. The

educational opportunity for visitors at the sites will be improved by the addition of native species that were used by the Nez Perce people as traditional foods and medicines.

The transition from nonnative to native species will be an extended process. Removal of noxious species on a regular maintenance schedule will be very important. Continued visual monitoring of all sites will be necessary to control any new invasive species.

Nonnative landscape plants should be replaced with native species when possible and practical. A native species adapted to the site should be planted when nonnative trees and shrubs are removed. Nonnative landscape plants should be prevented from proliferating and becoming invasive. As existing landscape specimens deteriorate in health and vigor, they should be replaced with a native specimen. All nonnative trees and shrubs with trunk diameters less than two inches should be removed annually. To encourage native species and discourage proliferation of nonnative species, subsequent annual removal of new seedlings or root suckers of nonnative trees and shrubs will be needed to keep all undesirable species in check at all sites.

Removal of invasive species, such as tree of heaven (*Ailanthus altissima*) and black locust (*Robinia psuedoacacia*) may be a long process requiring repeated treatment of recurring sprouts to gain control. Replanting of native species may require some experimentation to determine which species will tolerate the conditions created by the removal of the undesirable species. Each site may require a different approach depending on the location of the problem species. A systematic plan to remove and replant these problem areas can be developed by trial and error. This plan is a

beginning point for managing vegetation at the sites, yet site managers may need to adjust the recommendations to work at their site. Keeping a record of what is planted and what survives will be important in developing a plan. This vegetation management plan provides information and recommendations that enable site managers to maintain plants and the overall landscape in an environmentally sound manner.

IDAHO UNIT

CANOE CAMP, CLEARWATER COUNTY; OROFINO, IDAHO

SITE DESCRIPTION

OVERVIEW

The Canoe Camp site is adjacent to the Clearwater River, approximately 4 miles west of Orofino, Idaho, along U.S. Highway 12. At this site, the Lewis and Clark expedition built five canoes in September 1805. Residences are located to the west, commercial development across the highway to the south, and a large fish hatchery across the Clearwater River to the north. The National Park Service owns, manages, and maintains this 2.65-acre site, which was completely rehabilitated in 1993.

MANAGEMENT OBJECTIVE FOR CANOE CAMP

SITE MANAGEMENT OBJECTIVE

In keeping with the General Management Plan (National Park Service, 1997), the Canoe Camp site has two zones with objectives for each one. These are as follows:

- The *historic zone* will be managed to approximate natural conditions and includes most of the 2.65 acre site.
- The *developed zone* is made up of the 16-car parking lot and the entrance road.

VEGETATION COMPOSITION

At this site, the lawn area was planted in native grasses, but due to foot traffic and extensive mowing, the grasses are quite sparse. Native grasses such as Idaho fescue (*Festuca idahoensis*), slender wheatgrass (*Agropyron caninum*), and basin wild rye (*Elymus cinereus*) should be preserved, protected and encouraged to grow.

Several ponderosa pine (*Pinus ponderosa*) trees are scattered throughout the site as well as a row of nonnative juniper (*Juniperus virginiana*) along the west edge of the site (area 3). Northeast, along the Clearwater River (area 2), is a mixture of native species such as cottonwood (*Populus* sp.), chokecherry (*Prunus virginiana*), snowberry (*Symphoricarpos albus*), birch leaved spirea (*Spiraea betulifolia*), phlox (*Phlox* sp.), brodiaea (*Brodiaea* sp.), Oregon grape (*Mahonia repens*), rose (*Rosa* sp.), serviceberry (*Amelanchier alnifolia*), willow (*Salix* sp.) and black hawthorn (*Crataegus douglasii*). Nonnative maple (*Acer* sp.) trees are also present along the river. Area 2 bordering the river has some steep banks and level terraces containing various grasses, sedges, and native species similar to those mentioned previously. Several large ponderosa pines are growing to the east, and the lawn there is sparse.

The native species that are present at the site should be preserved and protected by the site manager and encouraged to grow. A few are of interest and worth protecting and possibly propagating for use at other locations. Birch-leaved spirea, Oregon grape as well as several rush (*Juncus* spp.) species are growing on the site. The native grasses present could serve as a seed source for revegetation of other sites in the future. See the vegetation composition list to identify other native species present as well as the relative abundance.

Species that can cause problems if uncontrolled are the tree of heaven (*Ailanthus altissima*) and blackberry (*Rubus* sp.) vines. The tree of heaven is difficult to control due to prolific seed dissemination and germination, as well as suckers from the roots.

Noxious species present are knapweed (*Centaurea maculosa*), yellow starthistle (*Centaurea solstitialis*), and field bindweed (*Convolvulus arvensis*). In addition to these noxious species, poison ivy (*Rhus radicans*), prickly lettuce (*Lactuca serriola*) and teasel (*Dipsacus sylvestris*) are present and can spread if left to grow at the site.

Many nonnative landscape species in area 1 include; lilac (*Syringa vulgaris*), forsythia (*Forsythia* sp.), periwinkle (*Vinca major*), daylilies (*Heemerocallis* sp.) and various spring bulbs.

SOIL SURVEY INFORMATION

One soil type, Crumrine Variant sandy loam, is present on this site with a 0 to 4% slope (Hoffman, 2002). This soil is very deep and very well drained on the upper terraces. The permeability is rapid and runoff is very slow. Water erosion on the bank to the river is a slight hazard, but most of this site is on level ground. Average annual precipitation is 20 to 23 inches, and the frost-free season is 120 to 150 days.

LANDSCAPE PLAN

RECOMMENDATIONS FOR CONTROL OF NOXIOUS PLANTS

The most serious problem at this site is the tree of heaven that will take over if not controlled. The large trees should be removed as well as the seedlings to prevent the spread of this nonnative, invasive species. This effort may take a few years to eradicate this species, but persistence and multiple methods of control will be beneficial. Removal of the largest trees before seed set is crucial to reduce the number of seedlings. In the places where these large trees are removed, monitoring the re-growth from the roots will be necessary or the trunk bases could be ground out. Basal bark application of triclopyr is a treatment for tree of heaven. To avoid having to find a basal

treatment oil, apply Pathfinder II. If this product, Pathfinder II is unavailable, then Garlon™ 4 mixed with a basal oil (20% Garlon™, 80% basal oil by volume) will work. Apply to 12-inch height at base of tree when trees are under 6 inches diameter or apply to 24-inch height at base of tree when trees trunks are over 6 inches in diameter. Apply the Garlon™ 4 and basal oil mixture in late winter to spring when tree is allocating resources to putting out new foliage (Prather, 2001). Follow all pesticide label directions.

The noxious species that should be removed are knapweed, yellow starthistle, and field bindweed. Chicory (*Cichorium intybus*), teasel, tansy (*Tanacetum vulgare*), and sweet clover (*Melilotus* sp.) are species that could spread if uncontrolled (all areas). The most abundant plants that should be removed first are tree of heaven and prickly lettuce. Manual removal would be the best recommendation for both of these species. Removing the existing plants will reduce the seed source.

REVEGETATION RECOMMENDATIONS

To promote establishment of native grasses, a mixture of seeds and established native grass plugs should be planted in the areas where the existing grasses are sparse. The seed mixture that should be used in this area is Grass Seed Mixture #1 (see Appendix A), applied at a rate of 15 to 20 lb. per acre (Mustoe, 2001). A few woody species recommended for the center of the site are cascara (*Rhamnus purshiana*), black hawthorn (*Crataegus douglasii*), red osier dogwood (*Cornus stolonifera*), and snowberry planted randomly following the walkways (area 3). In addition to these woody plants, native roses, such as nootka or Wood's rose (*Rosa hispida* or *R. woodsii*), should grow well at the site. The central area should be

intermixed with the native grasses and other native species mentioned above (inside the pathway in area 3). The birch-leaved spirea along the river can be divided and some moved to area 3 as well as some of the other native species on the site such as brodiaea, rose and Oregon grape. Several paths descending the riverbank along area 2 are causing erosion problems and should be planted with established plants of giant wild rye, red osier dogwood, ocean spray, or black hawthorn to discourage their use.

HAZARD TREE RECOMMENDATIONS

The term hazard tree refers to a tree that presents some sort of hazard to a person or building. Taking appropriate action is very important in situations that involve the safety of visitors and may present liability. All trees should be assessed on a yearly basis for broken or hanging limbs. Shrubs should be examined for damaged branches that may be walked into or otherwise endanger a visitor or employee. All of the ponderosa pine trees should be checked frequently for dead or damaged limbs that may present a hazard, and these branches should be removed. A qualified arborist should be contracted to inspect each tree on the entire site annually for structural integrity and to minimize potential hazards, such as falling limbs and trunks.

ROUTINE LANDSCAPE MAINTENANCE RECOMMENDATIONS

Several large ponderosa pines are located to the east side of the site (area 3), and the lawn there is sparse and should not be mowed. The open lawn area in the center of the site should be allowed to grow so that the native species can become established (area 3). To promote establishment, a native grass seed mixture (see Grass Seed Mixture #1 in Appendix A) and established grass plugs should be planted. A barrier of native plants around the edge of this area should discourage foot traffic and

allow the native grasses to become established. Syringa, the Idaho state flower, can be used around the perimeter as well as red osier dogwood, black hawthorn and cascara.

The health of the lilac and forsythia located in area 1 is questionable, and these nonnative species should be replaced with native species, such as serviceberry. To maintain the flowering qualities and appearance of these native species, about one-quarter to one-fifth of the oldest branches could be removed with care each year to avoid extreme alterations in the size and shape of the shrubs. This pruning will stimulate new growth from the base and maintain flowering. Pruning out dead or diseased wood on all the trees and shrubs will be helpful to the growth and health of the plants.

The juniper (*Juniperus virginiana*) trees have a serious infestation of cedar apple rust on the western edge of the site (west edge of area 3). These nonnative junipers should be removed and replaced with a native species, such as serviceberry or black hawthorn. Some of the branches on the ponderosa pine (*Pinus ponderosa*) also have a disease, Western gall rust. Gall infested branches should be removed to prevent spreading the disease and to eliminate potentially weakened limbs. Monitoring visually and removing all galls as soon as they are seen will help control this problem.

Along the river (area 2), native plants should be preserved as much as possible and any invasive nonnative plants removed. The *Prunus* species in this area are infected with black knot, a fungal disease, which should be cut out and burned. Infected tissues should be completely removed from the site to help control the spread of this problem. Removing all black knot infested branches from the site eliminates the inoculum source and helps to control this disease.

The large blackberry bramble next to the old time capsule (area 3) could be removed or cut back completely to the ground. Complete removal may be difficult, and grinding the stumps may work, but cutting it back will reduce it to a more controllable size.

Aerating is a process of opening air channels in the soil to allow room for air, water, fertilizer, and root development in the lawn. The roots have room to grow and spread, giving the plant renewed life and growth. Aerating is the most important low cost maintenance practice that can be done for the lawn. If nothing else is done except aerate, the lawn will show an improvement. Two common types of aerators are spike aerators and core aerators. Spike aerators poke a hole in the ground without removing a plug of soil. The core type removes a soil plug and deposits it on the surface of the lawn. The core type is by far the most effective. The soil plugs may be left in place on the surface. In fact, they are helpful to the lawn by reducing the thatch layer, reducing compaction, and adding organic matter to the surface. Aerating reduces the thatch layer because more air (oxygen) is made available to the microbes that decompose the thatch. Also, if overseeding an area, the cores of soil provide a good seedbed. The soil type and amount of foot traffic influence the need for aeration. If the soil is well drained and the amount of foot traffic is light, aeration may be needed only once per year. In heavily traveled areas such as footpaths or adjacent areas, once in the spring and again in the fall will help to improve the grass health and reduce surface compaction.

SUMMARY

The most important problems at this site are grass health and the presence of nonnative species, such as the lilacs, the disease-infested junipers, and the *Rhus*

species along the river. Any noxious or invasive species must also be controlled.

Manual removal of unwanted species would be the safest and most effective method to use if some control methods (e.g., herbicides) should be avoided due to environmental concerns. To be effective, manual removal will need to be done monthly, and the site will have to be visually monitored to catch any new infestations of unwanted species.

Herbicide use should be limited especially near waterways or desirable plants but use of chemical control is a necessary tool.

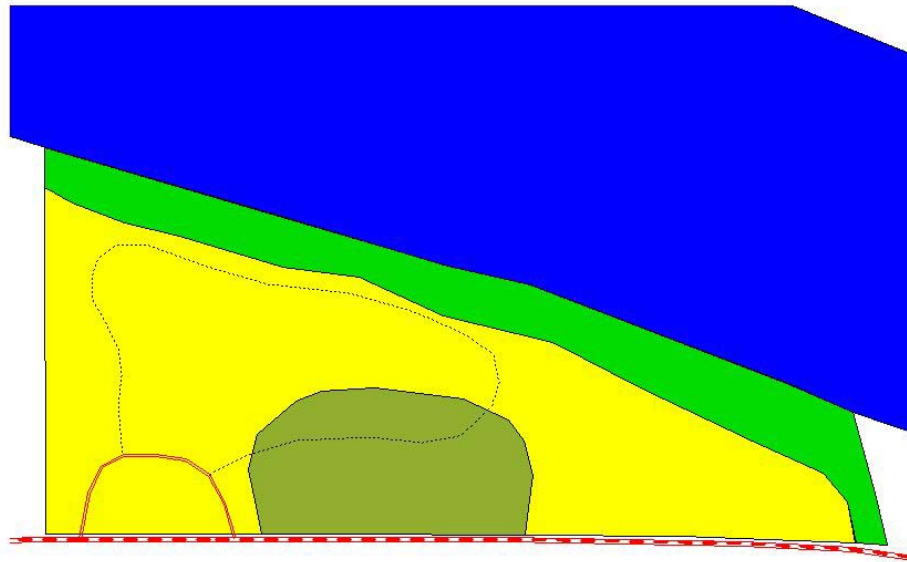
Native grasses should be planted at the site and foot traffic should be minimized in the planted areas. Mowing, if needed could be completed once a year and only after the seeds have filled out. Grasses should be mowed at a height of 6 inches or higher. The ponderosa pines and other large trees should be checked annually to determine plant health and structural integrity. By controlling undesirable species and replanting with native species, the site will have a more natural appearance and should be appealing to visitors.

VEGETATION COMPOSITION

Canoe Camp	Clearwater County	Orofino, Idaho	
Common name	Scientific name	Native\nonnative	Abundance
Barnyardgrass	<i>Echinochloa crusgalli</i>	nonnative	occasional
Basin wild rye	<i>Elymus cinereus</i>	native	occasional
Birch-leaved spirea	<i>Spiraea betulifolia</i>	native	occasional
Black medic	<i>Melilotus</i> sp.	nonnative	occasional
Blackberry	<i>Rubus</i> sp.	introduced	common
Bladder campion	<i>Lychnis alba</i>	native	occasional
Bracken fern	<i>Pteridium</i> sp.	native	common
Broad-leaved plantain	<i>Plantago major</i>	nonnative	occasional
Brodiaea	<i>Brodiaea</i> sp.	native	occasional
Buckhorn plantain	<i>Plantago lanceolata</i>	nonnative	occasional
Bulbous bluegrass	<i>Poa bulbosa</i>	nonnative	occasional
Bulrush	<i>Scirpus acutus</i>	native	occasional

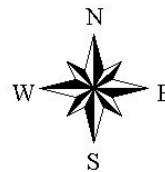
Cascara	<i>Rhamnus purshiana</i>	native	uncommon
Chicory	<i>Cichorium intybus</i>	nonnative	occasional
Chokecherry	<i>Prunus virginiana</i>	native	occasional
Cottonwood	<i>Populus</i> sp.	native	occasional
Curly dock	<i>Rumex crispus</i>	introduced	uncommon
Daisy	<i>Eriogeron</i> sp.	cultivated	occasional
Dandelion	<i>Taraxacum officinale</i>	nonnative	occasional
Day lily	<i>Hemerocallis</i> sp.	cultivated	occasional
Deptford pink	<i>Dianthus armeria</i>	introduced	occasional
Dogbane	<i>Apocynum</i> sp.	native	occasional
Field bindweed	<i>Convolvulus arvensis</i>	nonnative	common
Forsythia	<i>Forsythia</i> sp.	cultivated	occasional
Goldenrod	<i>Solidago</i> sp.	native	occasional
Grape hyacinth	<i>Muscari</i> sp.	cultivated	occasional
Hawthorn	<i>Crataegus</i> sp.	native	occasional
Horsetail	<i>Equisetum</i> sp.	native	occasional
Idaho fescue	<i>Festuca idahoensis</i>	native	occasional
Intermediate wheatgrass	<i>Agropyron intermedium</i>	nonnative	occasional
Juniper	<i>Juniperus virginiana</i>	cultivated	occasional
Lambsquarter	<i>Chenopodium album</i>	nonnative	occasional
Lilac	<i>Syringa vulgaris</i>	cultivated	occasional
Maple	<i>Acer</i> sp.	cultivated	occasional
Mullein	<i>Verbascum thapsus</i>	nonnative	occasional
Oregon grape	<i>Mahonia repens</i>	native	occasional
Periwinkle	<i>Vinca major</i>	cultivated	occasional
Phlox	<i>Phlox</i> sp.	native	occasional
Pineappleweed	<i>Matricaria matricarioides</i>	nonnative	occasional
Poison ivy	<i>Rhus radicans</i>	nonnative	occasional
Ponderosa pine	<i>Pinus ponderosa</i>	native	occasional
Prickly lettuce	<i>Lactuca serriola</i>	nonnative	common
Purple filaree	<i>Erodium cicutarium</i>	nonnative	occasional
Queen Anne's lace	<i>Daucus carota</i>	nonnative	occasional
Red osier dogwood	<i>Cornus stolonifera</i>	native	occasional
Red top	<i>Agrostis alba</i>	nonnative	occasional
Rose	<i>Rosa</i> sp.	native	occasional
Russian wild rye	<i>Elymus junceus</i>	nonnative	occasional
Rye	<i>Secale cereale</i>	nonnative	occasional
Salsify	<i>Tragopogon dubius</i>	nonnative	occasional
Scribner witchgrass	<i>Panicum scribnerianum</i>	native	occasional
Self-heal	<i>Prunella lanceolata</i>	native	occasional
Serviceberry	<i>Amelanchier</i> sp.	native	occasional
Sheep sorrel	<i>Rumex acetosella</i>	nonnative	occasional
Slender wheatgrass	<i>Agropyron caninum</i>	native	occasional
Smooth brome	<i>Bromus inermis</i>	nonnative	occasional

Snowberry	<i>Symphoricarpos albus</i>	native	occasional
Soft rush	<i>Juncus</i> sp.	native	occasional
Spotted knapweed	<i>Centaurea maculosa</i>	nonnative	occasional
St. John's wort	<i>Hypericum</i> sp.	native	occasional
Tansy	<i>Tanacetum vulgare</i>	native	occasional
Teasel	<i>Dipsacus sylvestris</i>	nonnative	common
Tree of heaven	<i>Ailanthus altissima</i>	cultivated	common
Vetch	<i>Vicia sativa</i>	nonnative	occasional
White clover	<i>Trifolium repens</i>	introduced	occasional
White sweet clover	<i>Melilotus alba</i>	introduced	occasional
Willow	<i>Salix</i> sp.	native	occasional
Wooly plantain	<i>Plantago patagonica</i>	native	occasional
Yellow starthistle	<i>Centaurea solstitialis</i>	nonnative	uncommon



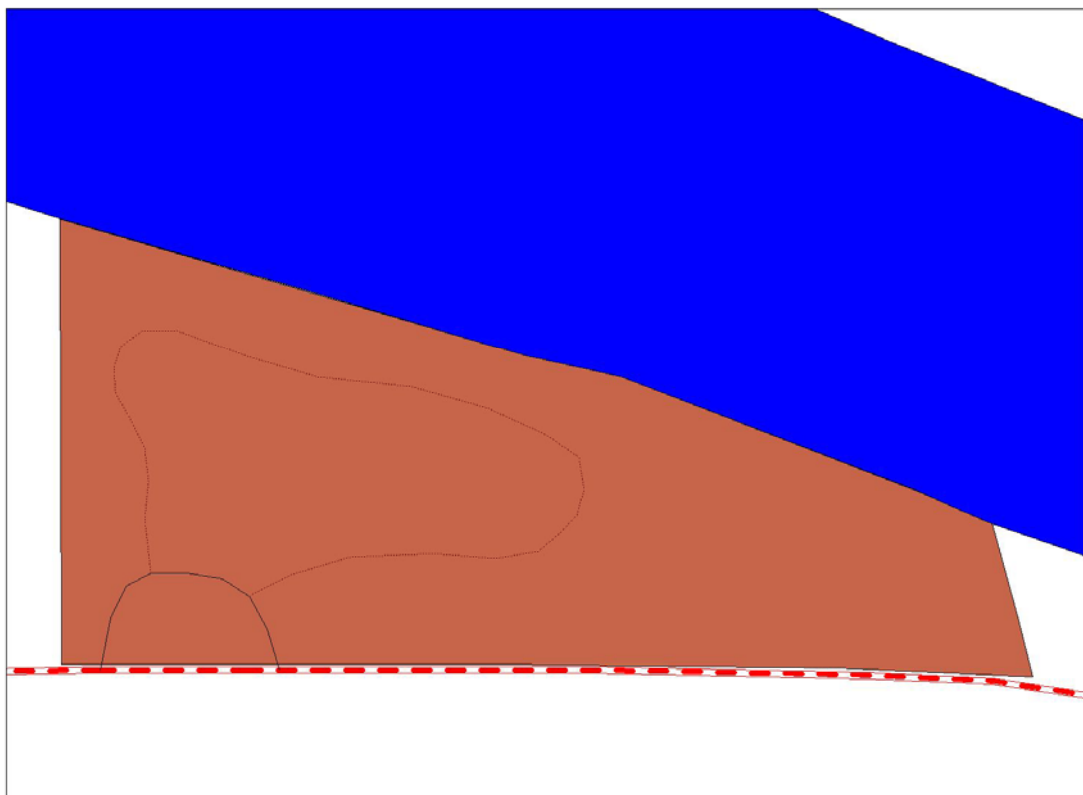
0.03 0 0.03 0.06 Miles

- Roads & Trails**
- Hwy 12
 - Park Drive
 - Trail
- Clearwater River**
-
- Vegetation Management Areas**
- Area 1
 - Area 2
 - Area 3



Canoe Camp Vegetation Management Areas

Nez Perce National Historical Park GIS - 2002



0.04 0 0.04 0.08 Miles

Transportation
 Highway 12
 Parking lot
 Trail
 Hydrology

Soils
 Crumarine Variant sandy loam



Canoe Camp Soils

HEART OF THE MONSTER, IDAHO COUNTY; KAMIAH, IDAHO

SITE DESCRIPTION

OVERVIEW

This site is approximately 53 acres of NEPE owned land 2 miles upstream from the Highway 95 bridge across the Clearwater River in Kamiah, Idaho. The largest portion of the property is bordered on the east by U.S. Highway 12 and on the west by the Clearwater River. Approximately 9 acres of the site are located to the east of the highway and abut a privately owned RV park. This site was a major prehistoric and historic Nez Perce crossing point on the Clearwater River. The nontreaty Nez Perce forded the Clearwater at this location during the 1877 war. An interpretive shelter with two exhibits offers an audio program to provide background information on the role of legends in Nez Perce culture. One exhibit tells a part of the "Coyote and the Monster" legend in Nez Perce and in English. A short trail leads to the Heart of the Monster formation, where a small semicircle of seating is available. This formation is said to represent the heart of a monster in this important Nez Perce legend. Heart of the Monster has been designated by the state of Idaho as a "watchable wildlife" site.

The site is well signed and easy to find. A paved entrance loop with parking for eight cars is at the site. Available visitor facilities include rest rooms, an interpretive panel with park information, a water fountain, picnic tables, the interpretive shelter, and two short trails. One of these trails leads to the interpretive shelter, and the second is a loop trail that leads to the Heart of the Monster rock formation.

The surrounding land is used for a mixture of agricultural, residential, and small commercial concerns. The 325-unit RV Park, just across the highway from the site, is

one of the largest private campgrounds in Idaho. Its expansion, together with the construction of a motel and residential housing in recent years, has encroached near the eastern part of the site. The Kamiah community has expressed an interest in developing a walking path from Kamiah to the site. The actual path location is uncertain at this time.

MANAGEMENT OBJECTIVE FOR HEART OF THE MONSTER

SITE MANAGEMENT OBJECTIVE

In keeping with the General Management Plan (National Park Service, 1997), the Heart of the Monster site has two zones with objectives for each one. These are as follows:

- The *historic zone* will be managed to approximate natural conditions and includes the site, the geologic features of the "Heart of the Monster" and the "Liver of the Monster", along with the fields and river front areas.
- The *developed zone* is the paved entrance loop with an 8-car parking lot, a restroom, interpretive panel, picnic tables, and the interpretive shelter.

VEGETATION COMPOSITION

The plants in this area are mostly introduced, but several native species are present in abundance. An area around the rest rooms and paved walkways is maintained as a lawn, however, little grass is present (east side of area 6). These mowed areas are mostly black medic (*Medicago lupulina*) and mallow (*Malva neglecta*), nonnative species rather than grasses. The field surrounding the site (areas 4 & 6) consists of hay and pasture type grasses and various undesirable noxious species such as knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense*), and field

bindweed (*Convolvulus arvensis*). The bank along the river (area 1) contains a mixture of native species with a few introduced trees, such as, walnut (*Juglans* sp.) and maple (*Acer* sp.), as well as nonnative forbs and grasses, such as teasel (*Dipsacus sylvestris*), bittersweet nightshade (*Solanum dulcamara*) and timothy (*Phleum pratense*).

Some native species worth noting are cascara (*Rhamnus purshiana*), red osier dogwood (*Cornus stolonifera*), and thimbleberry (*Rubus parviflorus*). All of these species are present (area 1) and could be propagated for use at other park sites or at various locations on this site.

A path follows the edge of the river to the end of the park site (east edge of area 1) and intersects an old gravel road that leads out to the highway. Along this road, a thicket of black locust (*Robinia psuedoacacia*) has formed (area 3). This end of the field is covered with knapweed, Canada thistle, scotch thistle (*Onopordon acanthium*) and teasel (areas 2 & 4). The path out to the Heart of the Monster is paved and mowed about three to four feet on each side of the walkway. At the end of the paved walk is a group of black locust trees and some lilac (*Syringa vulgaris*) shrubs, providing shade for visitors (area 7). A mowed area around the mound is mostly nonnative grasses and knapweed (area 5). The Heart of the Monster rock formation has many invasive, nonnative species, such as Canada thistle, scotch thistle, knapweed and teasel. Native plants present are black cottonwood (*Populus trichocarpa*), serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos albus*), elderberry (*Sambucus cerulea*) and desert parsley (*Lomatium macrocarpum*).

SOIL SURVEY INFORMATION

Three soil types are present on this site (Webb and Preece, 1971). The first is Nicodemus loam (NcA), which is mainly in bottomlands and low terraces along the Clearwater River. The slope is 0 to 7%. The soil is loam or fine sandy loam but is silt loam in some areas. Some areas are poorly drained in swales and are depressions covered with sedges (*Carex* sp.), rushes (*Scirpus* sp.), redtop (*Agrostis* sp.), and willows (*Salix* sp.). Some alder (*Alnus* sp.) and red cedar (*Thuja plicata*) are found in this soil type, although none were observed growing here. The natural vegetation on this soil type is mostly bunchgrasses, forbs, shrubs, scattered deciduous trees, Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). Permeability is moderately rapid, runoff is slow and the hazard of erosion is slight. This soil is moderately fertile but has some cobbles on the surface.

The second type of soil, Jackknife silt loam, loamy variant (JcB) has 7 to 12% slopes. This soil is found on alluvial fans on the edges of river terraces. Runoff is medium, and the hazard of erosion is moderate. This soil is used for home sites and cultivated crops, but part is pastured. Common vegetation on this soil consists mainly of bunchgrasses and a few scattered ponderosa pines.

The third soil component is Riverwash (Re) found along the Clearwater River. This soil consists of coarse gravel and cobble.

LANDSCAPE PLAN

RECOMMENDATIONS FOR CONTROL OF NOXIOUS PLANTS

Plants to be removed from this site include black locust, knapweed, scotch thistle, and Canada thistle. Others that should be controlled to prevent their spread are

bindweed, honeysuckle vine (*Lonicera japonica*), teasel, fiddleneck tarweed (*Amsinckia retrorsa*), and blackberry (*Rubus discolor*).

Methods that are environmentally friendly are mechanically removing undesirable herbaceous species or releasing biological control insects. Mechanical removal by hand pulling or hoeing is effective but needs to be done frequently to get the sprouts from pieces of root left in the ground or seeds that may germinate after the soil is disturbed. All areas of this site should be visually monitored monthly throughout the growing season for new infestations of noxious plants, and they should be removed when found. Using the treatments described in the Recommendations for Control of Noxious Plants in the Canoe Camp section can eliminate black locust trees and their sprouts (area 3). The black locust trees on the east edge of the property next to the campground present a potential hazard to campers and should be removed and replaced with ponderosa pine.

Mechanically removing (i.e., hoeing or hand pulling) the scotch thistle and knapweed will start the process of reclaiming the riverbank (area 1). This procedure would be the best and safest method of controlling all noxious plants that are near wetland areas, streams or areas that border the river. Protective clothing and gloves should be worn when manually removing these plants as they have thorns and alkaloids that can cause skin irritation. The Canada and scotch thistles should be cut down before their seeds mature to prevent further spread (all areas). The scotch thistle is biennial so preventing seed production will start to reduce the population.

For Canada thistle, crown/root weevils (*Ceutorhynchus litura*), seed head weevils (*Rhinocyllus conicus*), and stem gallflies (*Urophora cardui*) are biocontrol insects that

have worked in Oregon. Biocontrol insects for spotted knapweed that are present are seed head gall flies (*Urophora affinis* and *U. quadrifaciata*). Seed head weevils (*Larinus minutus* or *L. obtusus*) and seed head moths (*Metzneria paucipunctella*) could be present, but at the time of this study none were seen. The 2001 Pacific Northwest Weed Control Handbook (William et al., 2001). should be checked annually for revisions, as other biocontrol insects may become available.

The chemical method of controlling bindweed is spot treating with Roundup™ or 2,4-D, following the label directions, when the plants are in early bud to full bloom for best effect. As new sprouts or seedlings emerge, they can be pulled manually or retreated with one of the recommended herbicides. Care must be taken to avoid spraying herbicides on other nontarget plants, and herbicide treatments may be unfavorable to the beneficial insects released as biocontrol agents. The use of herbicides should be limited to areas away from native species or where these species will be planted as well as away from waterways.

Biocontrol agents for bindweed are a bud and leaf gall mite (*Aceria malherbae*) and a defoliating moth (*Tyta luctuosa*). Both are listed as a biological control in the 2001 Pacific Northwest Weed Control Handbook (William et al., 2001). The status of these insects in Idaho is unknown but may be worth examining.

The best control is achieved by employing a combination of all methods (Integrated Pest Management), and if herbicides are used, the class of herbicide should be rotated by using a different class seasonally to prevent herbicide resistance by some weed species.

Some nonnative species have become dominant in the mowed areas such as mallow and black medic. These species can be controlled with the use of a broadleaf herbicide at the label recommended rate used as a spot treatment. Hand pulling in areas where herbicides could damage other species or where there are wetlands or riparian zones is recommended.

REVEGETATION RECOMMENDATIONS

A mixture of grasses on this site is fairly well established. Native grass and sedge plants should be planted where large areas of nonnative plants have been removed. A mixture of native grass species should grow well and enhance the site. The recommended mixture is Grass Mixture #2 described in Appendix A. This mixture will help keep the unwanted grass species in check. Grass seeds should be applied at a rate of 15 to 20 lb. per acre in areas that are bare or broadcast by hand in smaller areas where some plants are present. The heavier seeding rate is recommended if the seed are left on the surface rather than raked in or covered (Mustoe, 2001). Sedges (*Carex* sp.) and forbs, such as camas (*Camassia quamash*), could also be added. Sedges and camas prefer areas that are moist in the spring, but they will tolerate some drier conditions in the summer.

HAZARD TREE RECOMMENDATIONS

The term hazard tree refers to a tree that presents some sort of hazard to a person or building. Taking appropriate action is very important in situations that involve the safety of visitors and may present liability. All trees should be assessed on a yearly basis for broken or hanging limbs. Trees with conks or fungal fruiting bodies growing on them indicate that decay organisms are growing within the trees, and they could be

hazardous. Other trees have structurally weak limbs or lack proper care (e.g., pruning), making them potentially hazardous. A certified arborist should be contracted to examine each tree on the entire site, particularly along the walkway, once a year to ensure the trees are structurally sound and to minimize the hazards of falling limbs and trunks.

Shrubs should be examined for damaged branches that may be walked into or otherwise endanger a visitor. The shrubs along the pathway to the interpretive shelter should be checked frequently for broken limbs and dead wood. These limbs should be removed when seen or at least annually.

ROUTINE LANDSCAPE MAINTENANCE RECOMMENDATIONS

Aerating may be needed once a year, depending on the amount of foot traffic on the grassy areas. Aeration is beneficial for establishment and maintenance of grasses. See the Routine Landscape Maintenance Recommendations in the Canoe Camp section for a description of aeration benefits and procedures.

As the process of removing unwanted noxious species starts, the site will benefit from planting established native grass plants and seeds. Mature native grasses often out-compete most introduced broadleaf plants when left alone (mowing eliminated) or mowed to a height of six inches or taller only once a year. Mowing once, only in late summer after seeds have filled out, will allow the grasses to set seeds and be dispersed. The site should be visually monitored monthly for new nonnative problems, and manual removal of nonnative plants will be necessary until the native grasses are established. Mowed areas should be reduced and eliminated. If necessary, however,

mowing can be used for firebreaks or safety reasons, and mowing should be limited to a narrow three-foot strip along the walkways once a year. The circle in the center of the parking lot should not be mowed.

SUMMARY

Landscape management at the site addresses control of noxious species, replanting with native plants, hazard tree recommendations, and routine maintenance. The most important goals at this site are to re-establish native grass species and prevent the spread of undesirable nonnative species. Replanting with native grasses and eliminating or minimizing mowing will allow native grasses to out-compete the nonnative grasses present at the site. By eliminating unwanted and noxious plants and replanting with native species, the site will have a more natural appearance and should be appealing to visitors.

VEGETATION COMPOSITION

Heart of the Monster Idaho County		Kamiah, Idaho	
Common name	Scientific name	Native/nonnative	Abundance
Apple	<i>Malus</i> sp.	nonnative	uncommon
Bachelor button	<i>Centaurea cyanus</i>	nonnative	occasional
Barnyard grass	<i>Echinochloa crusgalli</i>	nonnative	occasional
Bedstraw	<i>Galium aparine</i>	nonnative	occasional
Bittersweet	<i>Solanum dulcamara</i>	nonnative	occasional
nightshade			
Black locust	<i>Robinia psuedoacacia</i>	nonnative	common
Black medic	<i>Medicago lupulina</i>	nonnative	occasional
Blackberry	<i>Rubus discolor</i>	nonnative	common
Bladder campion	<i>Lychnis alba</i>	native	occasional
Broad-leaved plantain	<i>Plantago major</i>	nonnative	occasional
Brodiaea	<i>Brodiaea</i> sp.	native	occasional
Bull thistle	<i>Cirsium vulgare</i>	nonnative	occasional

Bulrush	<i>Scirpus acutus</i>	native	occasional
Camas	<i>Camas</i> sp.	native	occasional
Canada thistle	<i>Cirsium arvense</i>	nonnative	occasional
Cascara	<i>Rhamnus purshiana</i>	native	uncommon
Catnip	<i>Nepeta cataria</i>	nonnative	uncommon
Chokecherry	<i>Prunus virginiana</i>	native	occasional
Cottonwood	<i>Populus trichocarpa</i>	native	common
Cow-parsnip	<i>Heracleum lanatum</i>	native	occasional
Daisy	<i>Chrysanthemum leucanthemum</i>	nonnative	occasional
Dandelion	<i>Taraxacum officinale</i>	nonnative	occasional
Desert parsley	<i>Lomatium macrocarpum</i>	native	uncommon
Elderberry	<i>Sambucus cerulea</i>	native	uncommon
Evergreen blackberry	<i>Rubus laciniatus</i>	nonnative	occasional
Fern	<i>Pteridium</i> sp.	native	common
Fiddleneck tarweed	<i>Amsincka retrorsa</i>	nonnative	occasional
Field bindweed	<i>Convolvulus arvensis</i>	nonnative	common
Fleabane	<i>Erigeron strigosus</i>	nonnative	occasional
Goldenrod	<i>Solidago</i> sp.	native	occasional
Hawthorn	<i>Crataegus</i> sp.	native	common
Honeysuckle	<i>Lonicera japonica</i>	nonnative	occasional
Horsetail	<i>Equisetum</i> sp.	native	occasional
Hound's-tongue	<i>Cynoglossum officinale</i>	nonnative	occasional
Lilac	<i>Syringa vulgaris</i>	nonnative	occasional
Mallow	<i>Malva neglecta</i>	nonnative	common
Milkweed	<i>Asclepias speciosa</i>	native	occasional
Mockorange	<i>Syringa lewisii</i>	native	uncommon
Mullein	<i>Verbascum thapsus</i>	nonnative	occasional
Narrow-leaved plantain	<i>Plantago lanceolata</i>	nonnative	occasional
Orchard grass	<i>Dactylis glomerata</i>	nonnative	occasional
Plum	<i>Prunus domestica</i>	nonnative	occasional
Ponderosa pine	<i>Pinus ponderosa</i>	native	occasional
Prickly lettuce	<i>Lactuca serriola</i>	nonnative	common
Purple filaree	<i>Erodium cicutarium</i>	nonnative	occasional
Queen Anne's lace	<i>Daucus carota</i>	native	occasional
Red clover	<i>Trifolium beckwithii</i>	nonnative	uncommon
Red osier dogwood	<i>Cornus stolonifera</i>	native	occasional
Rose	<i>Rosa</i> sp.	native	occasional
Rough fescue	<i>Festuca scabrella</i>	native	common
Rush	<i>Scirpus</i> sp.	native	occasional
Salsify	<i>Tragopogon dubius</i>	nonnative	occasional

Scotch thistle	<i>Onopordon acanthium</i>	nonnative	occasional
Sedge	<i>Carex</i> sp.	native	occasional
Serviceberry	<i>Amelanchier alnifolia</i>	native	occasional
Sheep sorrel	<i>Rumex acetosella</i>	nonnative	occasional
Snowberry	<i>Symphoricarpos albus</i>	native	occasional
Soft brome	<i>Bromus mollis</i>	nonnative	common
Spearmint	<i>Mentha spicata</i>	native	occasional
Spotted knapweed	<i>Centaurea maculosa</i>	nonnative	common
St. John's wort	<i>Hypericum</i> sp.	nonnative	occasional
Teasel	<i>Dipsacus sylvestris</i>	nonnative	occasional
Thimbleberry	<i>Rubus parviflorus</i>	native	occasional
Timothy	<i>Phleum pratense</i>	nonnative	common
Tree of heaven	<i>Ailanthus altissima</i>	nonnative	common
Venus' looking-glass	<i>Triodanis perfoliata</i>	native	uncommon
Vetch	<i>Vicia sativa</i>	nonnative	occasional
Walnut	<i>Juglans</i> sp.	nonnative	uncommon
Watercress	<i>Rorippa nasturtium-aquaticum</i>	nonnative	occasional
Wheatgrass	<i>Agropyron</i> sp.	native	occasional
White clover	<i>Trifolium repens</i>	nonnative	occasional
Wild geranium	<i>Geranium maculatum</i>	native	common
Willow	<i>Salix</i> sp.	native	occasional
Wooly verbena	<i>Verbena bracteata</i>	nonnative	uncommon
Yarrow	<i>Achillea millefolium</i>	native	occasional

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0.2 0 0.2 0.4 Miles

- Boundary
- Transportation
 - Dirt Trail
 - Hard Trail
 - Hwy 12
 - NPS Road
 - Private
- Hydrology
- Vegetation
 - Riparian
 - Black locust
 - Grassland
 - Outcropping
 - Shrub
 - Forested
 - Wet Meadow



East Kamiah Vegetation



- Boundary
- Transportation
- Dirt Trail
- Hard Trail
- Hwy 12
- NPS Road
- Private
- Hydrology
- Soils
- JcB
- NcA
- Re



East Kamiah Soils

SPALDING, NEZ PERCE COUNTY; SPALDING, IDAHO

SITE DESCRIPTION

OVERVIEW

The Spalding Visitor Center is owned and operated by the NPS and is situated on an old river terrace. The level area now occupied by the parking lot and Visitor Center was cultivated prior to NPS management. Construction of the building has altered the area, and most of the landscape surrounding the lot and buildings is mowed lawn and ornamental landscape plants.

The Lapwai Mission Cemetery is protected, maintained, and interpreted through a cooperative agreement among the NPS, the Nez Perce Tribe, and the Spalding Presbyterian Church Board of Trustees. Wayside exhibits in the historic area along Lapwai Creek cover the early missionary and Indian Agency periods.

The following historic resources are in the NPS owned parts of the Spalding site:

- Watson's Store, which began as a trading post in 1911
- an Indian agency cabin, built in 1862 to implement the reservation system
- the Indian agent's residence, built in 1861, also from the reservation period
- archeological remains of the gristmill, sawmill, and associated millraces, built during the period from 1839 to 1840
- remnants of the Spalding mission, where Henry Harmon Spalding and his wife Eliza lived and worked after their move to this location in 1837
- the Arboretum established as part of Spalding Memorial Park in the 1930's
- numerous archeological remains, dating from as long as 11,000 years ago, found throughout the entire Lapwai Creek delta at its confluence with the Clearwater River

MANAGEMENT OBJECTIVE FOR SPALDING

SITE MANAGEMENT OBJECTIVE

In keeping with the General Management Plan (National Park Service, 1997), the Spalding site has four zones with objectives for each one. These are as follows:

- The *natural zone* will be managed to approximate natural conditions and includes the fields between the maintenance area and the agent's house, the streams (including the Clearwater River), and the surrounding hills that are in the site.
- The *historic zone* will be managed to approximate those conditions that represent the historic changes that have taken place on the site. This zone includes the historic millpond, the agent's house, the picnic area, the Spalding Mission site, the agency log structure, inactive cemeteries, Watson's Store, remnant earthworks, and the irrigation ditch.
- The *developed zone* will be managed in a developed nature, and maintained in a well-kept, park-like atmosphere. This zone includes the Visitor Center, headquarters, maintenance buildings, parking lots, access and circulation roads, restroom, and the pump house. These areas may be migrated to natural conditions over time to restore the native look and minimize maintenance.
- The *special use zone* will be managed in a manner similar to the developed zone and include the Spalding Presbyterian Church, active cemeteries, and the former Spalding post office.

VEGETATION COMPOSITION

The area around the parking lot of the Spalding Visitor Center consists of maintained lawn and some native grasses (area 15). To the west of the Visitor Center

parking lot is a green space (area 17) consisting of mainly sheep fescue (*Festuca ovina*), bluebunch wheatgrass (*Agropyron spicatum*) and some nonnative grasses such as cheatgrass (*Bromus* spp.). This area also has the potential for infestation by invaders such as yellow starthistle (*Centaurea solstitialis*) and teasel (*Dipsacus sylvestris*).

From the Visitor Center, near the entrance, a road runs eastward that leads to the lower portion of the site. This road is bounded on the north by area 16 and on the south by area 20. The vegetation in these areas is similar to that in area 17 described above. The roadside vegetation consists of mixed introduced nonnative and native grasses. Plants that may present problems in these areas are poison hemlock (*Conium maculatum*), bindweed (*Convolvulus arvensis*), teasel, blackberry (*Rubus* sp.), yellow starthistle, scotch thistle (*Onopordon acanthium*), Canada thistle (*Cirsium arvense*) and black locust (*Robinia psuedoacacia*). A few scattered clumps of rabbit-brush (*Chrysothamnus nauseosus*), arrowleaf balsamroot (*Balsamorhiza sagittata*), blanket-flower (*Gaillardia aristata*), rose (*Rosa* sp.), and cattail (*Typha latifolia*) are in area 16 as well as a few black locust and ponderosa pine (*Pinus ponderosa*) trees. In area 20, a patch of catchweed (*Asperugo procumbens*) should be removed to prevent seed dispersal down through the draw to the lower park areas (southeast side of area 20).

At the bottom of the hill, this road comes to an intersection leading north and south. To the north of the intersection, across the railroad track lays the Indian agent's residence (area 11). This area consists of a variety of introduced grasses that are maintained as a recreational lawn. The area also has nonnative trees and shrubs such as black locust, mulberry (*Morus alba*), apple (*Malus* sp.) and hybrid lilac (*Syringa*

vulgaris). The road to the northwest leads to the NPS service buildings (area 18) on a lower terrace with a mixture of native and nonnative grasses such as giant wildrye (*Elymus cinereus*), various wheatgrass species (*Agropyron* sp.), timothy (*Phleum pratense*), cheatgrass and numerous other species (area 19). This lower field has a fairly well diversified mix of grasses, but as the invasive species appear they will need to be controlled.

Just south of the residence is another intersection that runs to the east and leads to the picnic area and the Nez Perce cemetery. Across the road from the Indian agent's residence is Lapwai Creek with a bridge crossing (area 7); this road leads to a parking lot and separates the Lapwai Mission Cemetery (area 6) and the picnic area (area 3). Along the stream some invasive species need to be controlled (areas 7 & 13). Huge scotch thistle, poison hemlock, teasel, kochia (*Kochia scoparia*), knapweed (*Centaurea maculosa*) and yellow starthistle are some of the more serious vegetation problems in these areas as well as in area 10 where the poison hemlock is prolific.

Area 8, to the south after crossing the bridge, is covered with nonnative species from the road to the railroad and down to the cemetery. Bindweed, yellow starthistle, knapweed, mallow (*Malva neglecta*), prickly lettuce (*Lactuca serriola*), salsify (*Tragopogon dubius*), black locust saplings as well as narrow and broadleaf plantain (*Plantago* spp.) are the major problems in this area. Next to the cemetery is a stone wall with some small shrubs, ponderosa pine, western hemlock (*Tsuga heterophylla*), and white fir (*Abies concolor*) trees adjacent to it (area 6). Tree of heaven (*Ailanthus altissima*) is found throughout the entire site including some individual trees that are quite large; these trees are nonnative and have become invasive (areas 2 through 14).

The railroad boundary is an example of how prolific tree of heaven can become (south side of areas 2, 4, 6, & 8). In area 8, some nonnative maple (*Acer* sp.) trees are growing along with black locust trees and some shrubs (*Yucca glauca*) and hybrid lilac. Although some of the plants are in good shape, they should eventually be replaced with native species to restore the natural plant community. This area is mowed but has very sparse grass, which allows the noxious species to proliferate.

The area along the creek down stream from the bridge to the confluence of the river is heavily infested with Canada and scotch thistles, knapweed, yellow starthistle, teasel and poison hemlock (areas 7 & 10). Giant knotweed (*Polygonon sachalinense*) is also present and can spread; it should be monitored and kept from spreading by removing seeds before they disperse. Areas 7 & 13 are particularly sensitive with Lapwai Creek running through them creating a riparian habitat. The Clearwater River to the north forms another riparian habitat that is sensitive and will need to be handled carefully (areas 3, 5, 7, & 19 bordering the river).

The picnic area has a walking path that leads to the river with various interpretive signs for the gristmill and sawmill as well as the raceway (west side of area 3). A restroom is along this path, and the area surrounding it is heavily shaded with few plants growing there, except for some sparse grass, purple violet (*Viola* sp.) and sedge (*Carex* sp.). The lawn is closely mowed, and the trail is sandy gravel. Picnic tables and grills are located throughout the area. The lawn has some bare areas where it is heavily shaded.

Down the path from the restroom, to the northwest edge of area 3, is a tangle of maples with many seedlings under them. The path leads to the river where willow

(*Salix* sp.), maple, black cottonwood (*Populus tricocarpa*), and black locust trees grow along the bank as well as various grasses, sedges and some wild flowers (area 3).

Along the bank going east, up river, are various nonnative trees, such as tree of heaven and black locust (areas 3 & 5). Various native tree and shrub species, such as willow, box elder (*Acer negundo*) and red osier dogwood (*Cornus stolonifera*), are also along this riverbank.

The east end of the park grounds has become a thicket of black locust and tree of heaven with some paths through it. Various spring-flowering (bulb) species, iris (*Iris* sp.) and other herbaceous and woody ornamental species are also growing there but have had little maintenance (area 5). This area should be returned to native vegetation by removing nonnative species, reseeding with native grasses and burning the area every three to five years to keep nonnative plants from re-infesting the site.

Southeast toward the old highway, yellow starthistle is prolific and some bio-control insects have been released adjacent to this boundary in attempt to control the spread of this noxious species (area 4). These insects have been found in areas 4 and 5.

The grounds around the church have been mowed, but invasive species such as hound's tongue (*Cynoglossum officinale*), teasel, cheatgrass, bulbous bluegrass (*Poa bulbosa*), Canada thistle, giant knotweed, tree of heaven and black locust are present and need to be controlled (area 12). The surrounding woods are thick with many dead trees and branches (area 13). The large black locust trees in the churchyard have many dead limbs that could be hazardous. The rose and lilac plants in the front yard are overgrown with grasses.

The bank in front of the church next to the road is covered with poison hemlock, blackberry, and various grasses (east side of area 14). The ground at the bottom of this bank is quite wet and has some cattail, monkey flower (*Mimulus guttatus*) and sedge growing in it. This wetland area should be handled carefully. Black locust, rose, teasel, hound's-tongue, Canada thistle and hop vine (*Humulus lupulus*) are growing at the top of the bank. The black locust seedlings are numerous here and will continue to spread if not removed. Elderberry (*Sambucus cerulea*) and chokecherry (*Prunus virginiana*) are also present.

Across the road from the church is the Watson's Store with a large mowed yard to the southeast and to the northwest are more black locust trees and a large blackberry bramble (west side of area 14). The yard to the south is surrounded by black locust, lilac, chokecherry, mulberry, periwinkle (*Vinca major*) and Virginia creeper (*Parthenocissus quinquefolia*).

At the other end of the lawn is a house with various perennial plantings surrounding it, however, this building is slated for removal (south side of area 14). In the front and side yard are columbine (*Aquilegia* sp.), striped grass (*Miscanthus sinensis*), yucca, daylily (*Hemerocallis* sp.), iris, foxglove (*Digitalis* sp.), English ivy (*Helix helix*), buttercup (*Ranunculus* sp.), Oriental poppy (*Papaver* sp.) and bleeding heart (*Dicentra eximia*). The other side of the house and the backyard are mowed, but little grass is present. Mallow has taken over the grasses in the back yard. The bank behind the house is a thicket of hawthorn (*Crataegus* sp), chokecherry, and golden currant (*Ribes aureum*) up to U.S. Highway 95. Blackberry and black locust are nonnative species that are also on this bank and could become invasive.

SOIL SURVEY INFORMATION

Five soil types are present on the site (Hahn, 2002). The average annual precipitation is about 18 inches, and the growing season has approximately 165 frost-free days. The first soil is the Joseph-Tombeall complex (Ax3) with 0 to 2% slopes, which is in a flood plain area. This soil is very deep, moderately well drained, loamy coarse sand. This soil has a very rapid permeability and slow runoff. The hazard of water erosion is slight, but the depth of the water table is 36 to 60 inches from December to June restricting the rooting depth. Occasional flooding from December to June is the main restriction for this soil. The Tombeall soil is in the upper parts of the flood plain. This soil is very deep and somewhat poorly drained silt loam to a sandy loam. The permeability is moderate and runoff is very slow. A slight hazard exists for water erosion, and the main hazards are the seasonal high water table and occasional flooding. The wet soils also make this unit susceptible to soil compaction during wet periods. The natural plant community of this soil type consists of giant wildrye, black cottonwood, and sedges. The high content of gravel in the surface layer limits this soil for tillage and seeding. The periodic flooding limits the choices of plants.

The second soil type, Lapwai-Bridgewater complex (Pt1) with slopes of 1 to 4%, make up the stream terraces. This soil is a very deep, well-drained silt loam to a gravelly sandy loam with moderate permeability and slow runoff. The sandy loam is located on the lower ridges and gravel bars. The permeability on the lower parts is very rapid, and the hazard of water erosion is slight. The chances of flooding are rare. The high content of gravel in the surface layer may limit tillage and seeding operations.

The third type of soil is on the dissected alluvial terraces and is made up of Uhlig silt loam (Ju1) with 2 to 8% slopes. This soil is a very deep and well drained with moderate permeability and slow runoff. The main hazard is a moderate chance of water erosion since the soil is gravelly and lies on the low terraces and flood plains.

The fourth soil type is Chard silt loam (Cd1), which also exists on these terraces with 10 to 25% slopes. The steepness of slope makes the hazard of water erosion a primary concern. This soil has a calcareous sandy loam below the silt loam making it moderately alkaline, which may cause some nutrients to become unavailable to plants. The natural plant community is bluebunch wheatgrass and Sandberg bluegrass (*Poa sandbergii*).

The fifth type of soil is Uhlig silt loam (Ju3), and it is a very deep, well-drained soil on 20 to 35% slopes that are dissected by alluvial terraces. The permeability is moderate, and the runoff is rapid causing a very severe hazard of water erosion. Some calcareous inclusions, or embedded veins, are on the south and west facing slopes. Pockets of deep Waha soil are also on the steeper slopes. The main limitations of this soil are the steepness of the slope and the hazard of surface erosion.

LANDSCAPE PLAN

RECOMMENDATIONS FOR CONTROL OF NOXIOUS PLANTS

At the Visitor Center, bindweed is growing at the edges of the parking lot and along the road to the lower area as well as in the juniper hedge (*Juniperus* sp.) and various other locations throughout the site. These noxious plants can be removed in several ways. Combining all methods provides the best control. The existing hedges of juniper, privet (*Ligustrum vulgare*), and rose bushes around the Visitor Center should be

removed and replaced with native species that will restore the natural flora and improve the appearance of the area. The bindweed growing in the shrubs and landscape beds around the building should also be eliminated.

The best method of controlling bindweed is spot treating with Roundup™ or 2,4-D, following the label directions, when the plants are in early bud to full bloom for best effect. As new sprouts or seedlings emerge, they can be pulled manually or retreated with one of the recommended herbicides. Care must be taken to avoid spraying herbicides on other nontarget plants, and herbicide treatments may be unfavorable to beneficial insects released as biocontrol agents. Use of certain herbicides should be limited to areas away from native species or where these species will be planted as well as away from waterways. Herbicide labels should be checked for residual activity of the active ingredient.

Other methods that are more environmentally friendly are mechanical removal or releasing biological control insects. Mechanical removal by hand pulling or hoeing is effective but needs to be done frequently to get the sprouts from pieces of root left in the ground.

One biocontrol method involves a bud and leaf gall mite, *Aceria malherbae*, which is listed as a biological control in the 2001 Pacific Northwest Weed Control Handbook (William et al., 2001). The status of this insect in Idaho is unknown but may be worth examining. The best control is achieved by employing a combination of all methods (Integrated Pest Management), and if herbicides are used, the class of herbicide should be rotated with a different class seasonally to prevent herbicide resistance by some weed species.

The area at the front of the parking lot, the southeast side of area 17, has many unwanted species in it and should be burned in the spring and seeded with a native grass mixture and forbs (see replanting section). This mix of plants, once established, will provide a more appealing entrance to the site.

Mowing should be avoided, but if it becomes necessary mowing should be minimized, as outlined in the routine maintenance section. Discontinuing mowing will enable native grasses to out-compete invasive species such as yellow starthistle and knapweed. By eliminating most of the mowing, native grasses should thrive, reducing the number of nonnative species and restoring the natural plant community.

Mechanically removing (i.e., hoeing or hand pulling) the scotch thistle, yellow starthistle, and knapweed will start the process of reclaiming the stream bank (areas 7 & 13). This procedure would be the best and safest method of controlling all noxious plants that border the stream and river. Protective clothing and gloves should be worn when manually removing these plants as they have thorns and alkaloids that can cause skin irritation. Poison hemlock as well as Canada and scotch thistles should be cut down to the ground level before the seed matures to prevent further spread especially in areas 10 & 13. Poison hemlock and scotch thistle are biennial so preventing seed production will start to reduce their populations. *Agonopterix alstroemeriana*, a defoliating moth, is a biocontrol insect available for control of poison hemlock. A population of this insect is already established at this site (areas 2, 4 & 5). For Canada thistle, crown/root weevils (*Ceutorhynchus litura*), seed head weevils (*Rhinocyllus conicus*), and stem gall flies (*Urophora cardui*) are biocontrol insects that have worked well in Oregon, and they may work here. Biocontrol insects for spotted knapweed that

are present are seed head weevils (*Larinus minutus* and *L. obtusus*), seed head moths (*Metzneria paucipunctella*) and seed head gall flies (*Urophora affinis* and *U. quadrifaciata*) (Wilson, 2001). Various root feeders for spotted knapweed are listed in the 2001 Pacific Northwest Weed Control Handbook (William et al., 2001) and should be investigated for use at this site. Biocontrol insects that are present for yellow starthistle are a seed head weevil (*Bangasternus orientalis*) and seed head flies (*Chaetorellia australis* or *C. succinea*). Two seed head weevils (*Eustenopus villosus* and *Larinus curtus*) have shown good to excellent control. Although *E. villosus* has limited availability in Idaho, it should be released if possible. All areas of this site should be visually monitored throughout the growing season for new infestations of noxious plants, and they should be removed when found.

South of the picnic area (area 8) should be burned or sprayed with a broad-spectrum herbicide such as Roundup™ and reseeded with a native grass mixture (see replanting section). Care should be taken to avoid drift if sprayed in the stream area (areas 7 & 13) and near the trees and plants next to the cemetery (area 6).

The black locust and tree of heaven trees present a serious problem especially in area 5 and various places throughout area 3 along the river. Both should be removed and the stumps ground out or painted with Garlon™ following label directions. See the Recommendations for Control of Noxious Plants in the Canoe Camp section for directions on using Garlon™ 4 on cut stumps of black locusts. Subsequent sprouts that develop from black locust roots can be killed using 6.25% glyphosate in water (see label directions). Treatment for tree of heaven is basal bark application of triclopyr. To avoid having to find basal treatment oil, apply Pathfinder II. If this product, Pathfinder II,

cannot be found, use Garlon™ 4 as described in the Recommendations for Control of Noxious Plants in the Canoe Camp section.

Grinding out the stumps is probably the best and safest method to use if planning to replant the area with native species. Even after grinding the stumps, additional sprouting may develop from the roots. If herbicide is used, five consecutive years of treatment may be needed to control sprouts from the root system of removed trees (Prather, 2001). Along the river, these trees have shown that they are capable of taking over an area if allowed to proliferate (north boundary of areas 3 & 5). Use of chemicals along the waterways should be avoided or used as a last resort to protect the riparian areas. Seeds from both species (tree of heaven and black locust) should be collected and disposed of to control their spread until all the trees are removed. The seeds can be bagged with a lawn mower or raked up and bagged for composting to prevent germination. The grove of young black locust (area 5) should be removed as well as the ones in the picnic area (area 3) to prevent future spread of this invasive species. Black locust and tree of heaven sprouts from stumps or roots should be removed at least annually, but monthly removal would be best. Removing these invasive species will give desirable native plants, such as serviceberry (*Amelanchier alnifolia*) and syringa (*Philadelphus lewisii*), an opportunity to become established.

The ornamental shrubs, perennials, and bulbs, growing in the east side of area 5, should be removed completely, and native species present should be encouraged to proliferate. A few of the nonnative species that need removal are hyacinth (*Hyacinthus* sp.), daffodils (*Narcissus* sp.), rose campion (*Lychnis coronaria*), horehound (*Marrubium vulgare*), lemonbalm (*Melissa officinalis*), beautybush (*Kolkwitzia amabilis*) and bristly

locust (*Robinia hispida*). Along the old road bordering areas 2, 4, and 5 and throughout area 5, many other tree of heaven, black locust, and Russian olive (*Elaeagnus angustifolia*) trees are growing and need to be removed.

The lilac in the churchyard is in poor shape and may be rejuvenated by cutting out all dead and oldest wood (area 12). Because lilacs and roses were planted here as a decorative species to enhance the appearance of the church, these should be maintained. A large elderberry, in the backyard of the church, needs to have the dead wood removed. Various trees in the churchyard are in poor condition and should be eliminated or the dead limbs removed.

Black locust trees near Watson's store have hazardous limbs and should be removed for safety (area 14). All trees on the site should be inspected annually for dead limbs and health problems. A qualified arborist should be contracted to inspect the trees for structural integrity and potential hazards. Even though introduced, some of the black locust trees should be maintained in this area since they represent introduction of plants by westward expansion and the missionary activities on the site. These trees, however, should be prevented from spreading to other parts of the site.

REVEGETATION RECOMMENDATIONS

The area around the Visitor Center parking lot (areas 15 & 17) should be heavily seeded with a native grass mixture and herbaceous species as well as planting native grass plugs to get the area back to a natural species composition. The area should be burned in the spring and then dragged to loosen the soil for seedbed preparation and seed broadcast (southeast side area 17). The seed mixture that should be used in this area is Grass Seed Mixture #1 (see Appendix A), applied at a rate of 15 to 20 lb. per

acre. This rate can be doubled on steeper terrain (Mustoe, 2001). Species of grass plugs or established grass plants (all commercially available) that would grow well at this site are giant wildrye and Idaho fescue (*Festuca idahoensis*) or the species in the seed mix given above. Seeds can be used to plant any of these species, but using plugs will provide some cover for the newly seeded ground to become established. To enhance the site, native forbs could be added to areas 15 and 17. Some native plants that should grow well at the site include arrowleaf balsamroot, blanket flower (*Gaillardia aristata*), gray rabbit-brush and yarrow (*Achillea millefolium*). Native species that already exist on the site could be propagated by seed collecting or cuttings and used in this area. *Syringa*, red osier dogwood, currant, and black hawthorn are a few that could be used for cuttings as well as others listed in Propagation of Pacific Northwest Native Plants (Rose et al., 1998). This reference book also provides information on how and when to propagate native species. Planting these forbs will provide visitors with a view of the native plant life as well as aid in the prevention of destruction of the native grasses by mowing and foot traffic. Mowing should be unnecessary, but if needed should be minimal and preferably only after seeds have been set to allow the grasses to become established and promote native propagation. Mowing should be limited to once a year after seed set, and mowing height should be no lower than six inches.

In area 5, the outer edges of the yellow starthistle biocontrol area should also be planted with native grass plugs to establish a stand. Plugs can be planted in any area as the starthistle or other noxious plants die out. Grass plugs could be taken from areas 16, 17, & 20 making sure to avoid taking too many from one particular area. Grass plugs can be made by using a sharp digging tool, called a plugger, pushed into the soil

around a grass plant or through the sod, turning the tool as it gets deeper, forming a plug. Taking plugs should be done in the early morning before the heat of the day to prevent wilting. Although taking plugs of native grasses is somewhat experimental and some risk is involved, these native grasses should be able to be transplanted successfully if done during the grass dormant period (Hutton, 2001). The transplanting should also be done in the early spring, before the grass begins actively growing, and as early as the ground can be worked. When plugs of bunchgrasses are taken the procedure is slightly different. Bunches are divided into quarter sections after they are dug and each quarter is used as a plug. Care should be taken to avoid taking too many bunches from one area.

Planting native species in area 5 will help to fill in where the ornamental nonnative species are removed. Adding native species such as arrowleaf balsamroot, Clearwater phlox (*Phlox idahonis*), yarrow and yucca will also enhance area 5.

Shade tolerant native grasses should be planted under the trees within the picnic area where the existing grass is thin and around the restroom (area 3). These areas of native grasses should be marked off to prevent foot traffic and mowing. Native shade loving plants should be planted along the walk as well as native grass plugs. The violets behind the restroom could be transplanted to the pathways and around the restroom. The Clearwater phlox along the river could be divided and some of this moved up to the pathway also. Wild columbine (*Aquilegia formosa*) is a shade tolerant native species of forb appropriate for this area.

As introduced plants are removed along the roadway, species such as arrowleaf balsamroot, lomatium, yarrow and yucca should be planted throughout the site. These

plants will give visitors a point of interest along the walk into the picnic area and surrounding site.

HAZARD TREE RECOMMENDATIONS

All of the trees within the site need to be checked annually for dead or damaged limbs. This procedure will be important in all areas of the park to ensure the safety of the visitors and employees. Several trees in areas 3 and 5 have conks, fungal fruiting bodies, growing on them, indicating that decay organisms are growing within them. These trees should be monitored closely or removed due to the risk of limbs dropping on visitors. Other trees have structurally weak limbs or lack proper care (e.g., pruning), making them potentially hazardous. The trees in the churchyard (area 12) should be checked for dead limbs or disease infestation and pruned or removed as necessary. A certified arborist should be contracted to examine each tree on the entire site, particularly in the picnic area, once a year to ensure the trees are structurally sound and to minimize the hazards of falling limbs and trunks.

ROUTINE LANDSCAPE MAINTENANCE RECOMMENDATIONS

The recreational lawn surrounding the Visitor Center should be removed and native grasses planted to restore the area to a more natural plant community and to reduce maintenance. Species recommended for replanting are bluebunch wheatgrass, thick-spike wheatgrass and Idaho fescue in the amounts given previously in the revegetation section. The sprinkler system needs to be left in place to provide water for the establishment of the native grasses and moisture during drought periods as well as fire safety.

In order to promote native species vigor and propagation, mowing native grasses should be avoided throughout the entire site with the exception of fire buffer zones. As recreational lawn is eliminated and replaced with native species, mowing around the Visitor Center building should be limited to a narrow (3-foot) strip on either side of the sidewalks, the perimeter of the parking lot, and under the wood fences as a fire break. These areas should be mowed only after seeds have set and dropped (area 17). The mowing height should be no lower than six inches to promote native grasses and prevent competition from invasive species such as yellow starthistle and knapweed. Mowing should be done only once during a growing season after seeds have set and dropped (late summer to early fall). This amount of mowing will allow native grasses to become established and introduced plants to be removed yet give the edge a maintained appearance. The grasses along the roadside into the park should be allowed to grow out as well to establish a more natural setting.

In the picnic area (area 3), the lawn should be maintained in places used for picnics, with the exception of the shady areas where native grasses and forbs should be planted to establish some ground cover.

Aerating may be needed once or twice a year, depending on the amount of foot traffic on the grassy areas. Aeration is beneficial for establishment and maintenance of grasses. See the Routine Landscape Maintenance Recommendations in the Canoe Camp section for a description of aeration benefits and procedures.

Watering of the recreational lawn or native grass areas should be done on infrequent but deep watering cycles. Depending on the grass species and time of year, about 1 inch of water per week should be applied in one watering. An ideal way to

determine how much water has been put down is to use a "catch can test". This technique involves placing about 40 cans of the same size in an area and measuring how much water is caught in each can in an hour. The average of the water from all cans will provide the sprinkler system's "precipitation rate" and will be very important in determining how long to water. If manually controlling the sprinklers, workers will need to keep track of time to determine how long to irrigate. An automatic system will turn the water off for each section or area after a pre-determined amount of water has been applied. The system will then turn on the next section and off as described before, until the entire area or section has been watered. All of the sprinkler heads should be checked frequently to ensure that they are operating properly (Lawnmasters Lawn and Turf Care, 1997).

The pathways through the thicket (area 5) should be mowed only once a year after seed set to allow a more natural setting to form. Mowing height for all native grasses should be no lower than six inches.

Areas 16 and 20 should not be mowed to prevent the establishment of more invasive species such as yellow starthistle, tumbled mustard (*Sisymbrium altissimum*), and knapweed.

The fields along the river (area 19) should be tilled in strips (3 foot) with a nontilled strip in between, to allow some stability while establishing native grasses in the tilled bands. Using this strip method can be more easily mechanized and easier for workers to complete with machinery. This procedure will help re-establish the grassy river flats with a more diverse native species mix.

The existing hedges of juniper and privet, as well as rose bushes around the Visitor Center need to be removed and replaced with native species that will improve the appearance of the building as well as eliminating unnecessary maintenance. The banks that now have juniper on them should be planted with native ground covers such as kinnikinnick (*Arctostaphylos uva-ursi*), western clematis (*Clematis ligusticifolia*), twinflower (*Linnaea borealis*), or bunchberry (*Cornus canadensis*). Kinnikinnick and western clematis are all tolerant of drought and full sun. These species should be planted in areas that receive more sun. Twinflower and bunchberry mentioned above will tolerate partial to full shade and can be planted more abundantly in the shadier areas as well as among some of the other plants where they will receive some shade.

The manicured hedge in front of the Visitor Center can be replaced with a variety of native shrubs and forbs to highlight the indigenous flora. Some recommended species are Oregon grape (*Mahonia aquifolium*), syringe, desert parsley (*Lomatium dissectum*), or arrowleaf balsamroot. Many species may be suitable for this site and some of the species are growing in the area and could be transplanted or seed collected and sown in specific areas at the site.

Elderberry and chokecherry are present in area 12 and should be pruned removing all dead wood to improve the health of these native species.

SUMMARY

The most important part of maintaining the Spalding site is to control the nonnative and undesirable species. The best control of noxious or invasive species is to use all methods of control available. Manual removal of unwanted species would be the safest and an effective method to use if some control methods must be avoided. To

be effective, manual removal will need to be done monthly, and the site will have to be monitored to catch any new infestations of unwanted species. Herbicide use should be limited especially near waterways or plants that are desirable, but use of chemical control is a necessary tool. Biocontrol insects are also a valuable tool, and some are already established on this site. Although slow to establish, biocontrol insects can provide a safe, slow transition period for native plant species to become established where noxious species are diminished. The goal for this site is to control noxious plants and replant with native species so that the site will be restored to a more natural appearance and should be appealing to visitors.

VEGETATION COMPOSITION

Spalding

Nez Perce County

Spalding, Idaho

Areas 2 through 10 & Area 15

Common name	Scientific name	Native/nonnative	Abundance
Alfalfa	<i>Medicago sativa</i>	Nonnative	occasional
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	Native	occasional
Bachelor's button	<i>Centaurea cyanus</i>	Nonnative	occasional
Balsam fir	<i>Abies concolor</i>	Nonnative	uncommon
Barren brome	<i>Bromus sterilis</i>	Nonnative	common
Beautybush	<i>Kolkwitzia amabilis</i>	Nonnative	uncommon
Bedstraw	<i>Galium aparine</i>	Native	common
Bittersweet nightshade	<i>Solanum dulcamara</i>	Nonnative	occasional
Black locust	<i>Robinia psuedoacacia</i>	Nonnative	common
Black medic	<i>Medicago Lupulina</i>	Nonnative	common
Bladder campion	<i>Lychnis alba</i>	native	common
Blue spruce	<i>Picea pungens</i>	nonnative	uncommon
Bluebunch wheatgrass	<i>Agropyron spicatum</i>	native	common
Bluegrass	<i>Poa</i> spp.	nonnative	common
Box elder	<i>Acer negundo</i>	native	common
Bristly locust	<i>Robinia hispida</i>	nonnative	occasional
Broad-leaf plantain	<i>Plantago major</i>	nonnative	occasional
Brodiaea	<i>Brodiaea</i> sp.	native	occasional
Bur chervil	<i>Anthriscus scandicina</i>	nonnative	common
Burdock	<i>Arctium</i> sp.	nonnative	occasional

Canada thistle	<i>Cirsium arvense</i>	nonnative	occasional
Catchweed	<i>Asperugo procumbens</i>	nonnative	uncommon
Catnip	<i>Nepeta cataria</i>	nonnative	occasional
Charming barley	<i>Hordeum leporinum</i>	nonnative	common
Cheatgrass	<i>Bromus</i> spp.	nonnative	common
Chicory	<i>Cichorium intybus</i>	nonnative	common
Chokecherry	<i>Prunus virginiana</i>	native	occasional
Clearwater phlox	<i>Phlox idahonis</i>	native	common
Crabgrass	<i>Digitaria sanguinalis</i>	nonnative	occasional
Crested wheatgrass	<i>Agropyron cristatum</i>	nonnative	common
Curly dock	<i>Rumex crispus</i>	nonnative	occasional
Daffodil	<i>Narcissus</i> spp.	nonnative	uncommon
Daisy	<i>Chrysanthemum</i> spp.	nonnative	occasional
Dandelion	<i>Taraxacum officinale</i>	nonnative	common
Erect cinquefoil	<i>Potentilla recta</i>	nonnative	occasional
Fiddleneck tarweed	<i>Amsinckia retrorsa</i>	native	occasional
Field bindweed	<i>Convolvulus arvensis</i>	nonnative	common
Foxtail barley	<i>Hordeum murinum</i>	nonnative	common
Giant knotweed	<i>Polygonon sachalinense</i>	nonnative	occasional
Giant wildrye	<i>Elymus cinereus</i>	native	occasional
Golden currant	<i>Ribes aureum</i>	native	occasional
Goldenrod	<i>Solidago</i> sp.	native	common
Hawthorn	<i>Crataegus laevigata</i>	nonnative	uncommon
Honeylocust	<i>Gleditsia triacanthos</i>	nonnative	occasional
Horehound	<i>Marrubium vulgare</i>	nonnative	occasional
Horsetail	<i>Equisetum</i> sp.	native	occasional
Hound's-tongue	<i>Cynoglossum officinale</i>	nonnative	occasional
Hyacinth	<i>Hyacinthus</i> sp.	nonnative	uncommon
Intermediate wheatgrass	<i>Agropyron intermedium</i>	nonnative	common
Iris	<i>Iris</i> sp.	nonnative	occasional
Juniper	<i>Juniperus</i> sp.	nonnative	occasional
Knotweed	<i>Polygonum</i> sp.	nonnative	common
Kochia	<i>Kochia scoparia</i>	nonnative	occasional
Lambsquarter	<i>Chenopodium album</i>	nonnative	common
Lemon balm	<i>Melissa officinalis</i>	nonnative	occasional
Lilac	<i>Syringa vulgaris</i>	nonnative	occasional
Mallow	<i>Malva neglecta</i>	nonnative	common
Maple	<i>Acer</i> sp.	nonnative	occasional
Mayweed chamomile	<i>Anthemis cotula</i>	nonnative	common
Moth mullein	<i>Verbascum blattaria</i>	nonnative	common
Motherwort	<i>Leonurus cardiaca</i>	native	occasional
Mouse-ear chickweed	<i>Cerastium arvense</i>	native	occasional
Mulberry	<i>Morus alba</i>	nonnative	uncommon
Mullein	<i>Verbascum thapsus</i>	nonnative	occasional

Narrow-leaf plantain	<i>Plantago lanceolata</i>	nonnative	occasional
Nootka rose	<i>Rosa hispida</i>	native	uncommon
Orchard grass	<i>Dactylis glomerata</i>	nonnative	occasional
Oregon grape	<i>Mahonia repens</i>	native	occasional
Pennycress	<i>Thlaspi arvense</i>	nonnative	occasional
Perennial ryegrass	<i>Lolium perenne</i>	nonnative	occasional
Pigweed	<i>Amaranthus retroflexus</i>	nonnative	occasional
Plum	<i>Prunus domestica</i>	nonnative	uncommon
Poison hemlock	<i>Conium maculatum</i>	nonnative	common
Poison ivy	<i>Rhus radicans</i>	native	occasional
Ponderosa pine	<i>Pinus ponderosa</i>	native	occasional
Prairie sage	<i>Artemisia ludoviciana</i>	native	occasional
Prickly lettuce	<i>Lactuca serriola</i>	nonnative	common
Privet	<i>Ligustrum vulgare</i>	nonnative	occasional
Purslane	<i>Portulaca oleracea</i>	nonnative	occasional
Quack grass	<i>Agropyron repens</i>	nonnative	occasional
Queen Anne's lace	<i>Daucus carota</i>	nonnative	occasional
Ragweed	<i>Ambrosia trifida</i>	nonnative	occasional
Red osier dogwood	<i>Cornus stolonifera</i>	native	occasional
Redstem filaree	<i>Erodium cicutarium</i>	nonnative	common
Reed canarygrass	<i>Phalaris arundinacea</i>	nonnative	common
Rose	<i>Rosa</i> sp.	native	occasional
Rose campion	<i>Lychnis coronaria</i>	nonnative	common
Rough fescue	<i>Festuca scabrella</i>	native	common
Russian olive	<i>Elaeagnus angustifolia</i>	nonnative	occasional
Salsify	<i>Tragopogon dubius</i>	nonnative	common
Scotch thistle	<i>Onopordon acanthium</i>	nonnative	common
Sedges	<i>Carex</i> spp.	native	occasional
Serviceberry	<i>Amelanchier alnifolia</i>	native	occasional
Sheep fescue	<i>Festuca ovina</i>	nonnative	common
Silver poplar	<i>Populus alba</i>	nonnative	common
Smartweed	<i>Polygonum punctatum</i>	native	occasional
Smooth brome	<i>Bromus inermis</i>	nonnative	common
Snowberry	<i>Symphoricarpos albus</i>	native	uncommon
Soft brome	<i>Bromus mollis</i>	nonnative	occasional
Spotted knapweed	<i>Centaurea maculosa</i>	nonnative	common
Star of Bethlehem	<i>Ornithogalum</i> sp.	nonnative	uncommon
Stinging nettle	<i>Urtica dioica</i>	nonnative	occasional
Syringa	<i>Philadelphus lewisii</i>	native	occasional
Tansy	<i>Tanacetum vulgare</i>	native	occasional
Teasel	<i>Dipsacus sylvestris</i>	nonnative	common
Traveler's balm	<i>Clematis ligusticifolia</i>	native	occasional
Tree of heaven	<i>Ailanthus altissima</i>	nonnative	common
Tumblemustard	<i>Sisymbrium altissimum</i>	nonnative	common

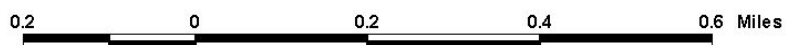
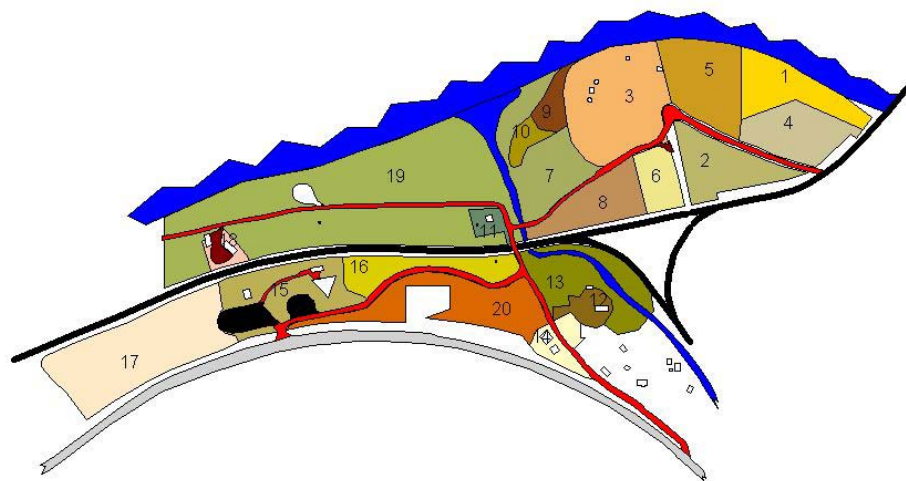
Vetch	<i>Vicia</i> sp.	nonnative	common
Violet	<i>Viola</i> sp.	native	common
Virginia creeper	<i>Parthenocissus quinquefolia</i>	nonnative	occasional
Western hemlock	<i>Tsuga heterophylla</i>	native	uncommon
White fir	<i>Abies concolor</i>	nonnative	uncommon
White spruce	<i>Picea glauca</i>	nonnative	uncommon
Wild cucumber	<i>Echinocytis lobata</i>	native	uncommon
Willow	<i>Salix</i> sp.	native	common
Willow-weed	<i>Epilobium</i> sp.	nonnative	occasional
Yarrow	<i>Achillea millefolium</i>	native	occasional
Yellow starthistle	<i>Centaurea solstitialis</i>	nonnative	common
Yucca	<i>Yucca glauca</i>	native	uncommon

AREAS 11 THROUGH 14 & AREAS 16 THROUGH 20

Apple	<i>Malus</i> sp.	native	uncommon
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	native	occasional
Autumn willowweed	<i>Epilobium paniculatum</i>	nonnative	occasional
Barren brome	<i>Bromus sterilis</i>	nonnative	common
Bedstraw	<i>Galium aparine</i>	native	common
Bittersweet nightshade	<i>Solanum dulcamara</i>	nonnative	occasional
Black locust	<i>Robinia psuedoacacia</i>	not native	common
Blackberry	<i>Rubus</i> sp.	nonnative	common
Bladder campion	<i>Lychnis alba</i>	native	common
Blanket flower	<i>Gaillardia aristata</i>	native	uncommon
Bleeding heart	<i>Dicentra eximia</i>	nonnative	uncommon
Bluebunch wheatgrass	<i>Agropyron spicatum</i>	native	common
Bluegrass	<i>Poa</i> spp.	nonnative	common
Bulbous bluegrass	<i>Poa bulbosa</i>	nonnative	common
Bur chervil	<i>Anthriscus scandicina</i>	nonnative	common
Buttercup	<i>Ranunculus</i> sp.	nonnative	uncommon
Canada thistle	<i>Cirsium arvense</i>	nonnative	occasional
Catchweed	<i>Asperugo procumbens</i>	nonnative	uncommon
Cattail	<i>Typha latifolia</i>	native	occasional
Charming barley	<i>Hordeum leporinum</i>	nonnative	common
Cheatgrass	<i>Bromus</i> spp.	nonnative	common
Chicory	<i>Cichorium intybus</i>	nonnative	common
Choke cherry	<i>Prunus virginiana</i>	native	occasional
Columbine	<i>Aquilegia</i> sp.	nonnative	occasional
Cottonwood	<i>Populus</i> sp.	native	occasional
Crabgrass	<i>Digitaria sanguinalis</i>	nonnative	occasional
Crested wheatgrass	<i>Agropyron cristatum</i>	nonnative	common
Day lily	<i>Hemerocallis</i> sp.	nonnative	occasional
Elderberry	<i>Sambucus cerulea</i>	native	uncommon

English ivy	<i>Hedra helix</i>	nonnative	common
Erect cinquefoil	<i>Potentilla recta</i>	nonnative	occasional
Fiddleneck tarweed	<i>Amsinckia retrorsa</i>	native	occasional
Field bindweed	<i>Convolvulus arvensis</i>	nonnative	common
Foxglove	<i>Digitalis</i> sp.	nonnative	uncommon
Foxtail barley	<i>Hordeum murinum</i>	nonnative	common
Giant knotweed	<i>Polygonon sachalinense</i>	nonnative	occasional
Giant wildrye	<i>Elymus cinereus</i>	native	occasional
Golden currant	<i>Ribes aureum</i>	native	occasional
Gray rabbit-brush	<i>Chrysothamnus nauseosus</i>	native	uncommon
Hackberry	<i>Celtis occidentalis</i>	nonnative	uncommon
Hawthorn	<i>Crataegus</i> sp.	native	occasional
Hoary cress	<i>Cardaria draba</i>	nonnative	uncommon
Hoary nettle	<i>Urtica dioica</i> var. <i>holosericea</i>	native	uncommon
Honeysuckle	<i>Lonicera japonica</i>	nonnative	occasional
Hop	<i>Humulus lupulus</i>	nonnative	occasional
Horehound	<i>Marrubium vulgare</i>	nonnative	occasional
Hound's-tongue	<i>Cynoglossum officinale</i>	nonnative	occasional
Idaho fescue	<i>Festuca idahoensis</i>	native	common
Intermediate wheatgrass	<i>Agropyron intermedium</i>	nonnative	occasional
Iris	<i>Iris</i> sp.	nonnative	occasional
Lilac	<i>Syringa vulgaris</i>	nonnative	occasional
Lomatium	<i>Lomatium</i> sp.	native	occasional
Mallow	<i>Malva neglecta</i>	nonnative	common
Maple	<i>Acer</i> sp.	nonnative	occasional
Monkey-flower	<i>Mimulus guttatus</i>	native	occasional
Mulberry	<i>Morus alba</i>	nonnative	occasional
Mullein	<i>Verbascum thapsus</i>	nonnative	occasional
Oriental poppy	<i>Papaver</i> sp.	nonnative	uncommon
Periwinkle	<i>Vinca major</i>	nonnative	common
Perennial ryegrass	<i>Lolium perenne</i>	nonnative	occasional
Poison hemlock	<i>Conium maculatum</i>	nonnative	common
Ponderosa pine	<i>Pinus ponderosa</i>	native	occasional
Prickly lettuce	<i>Lactuca serriola</i>	nonnative	common
Quack grass	<i>Agropyron repens</i>	nonnative	occasional
Red maple	<i>Acer rubrum</i>	nonnative	uncommon
Redstem filaree	<i>Erodium cicutarium</i>	nonnative	common
Reed canarygrass	<i>Phalaris arundinacea</i>	nonnative	common
Reed fescue	<i>Festuca arundinacea</i>	nonnative	common
Rough fescue	<i>Festuca scabrella</i>	native	common
Salsify	<i>Tragopogon dubius</i>	nonnative	common
Scotch thistle	<i>Onopordon acanthium</i>	nonnative	common
Sheep fescue	<i>Festuca ovina</i>	nonnative	common
Smooth brome	<i>Bromus inermis</i>	nonnative	common

Snowberry	<i>Symphoricarpos albus</i>	native	uncommon
Spotted knapweed	<i>Centaurea maculosa</i>	nonnative	common
Star of Bethlehem	<i>Ornithogalum</i> sp.	nonnative	uncommon
Stinging nettle	<i>Urtica dioica</i>	native	occasional
Striped grass	<i>Miscanthus sinensis</i>	nonnative	occasional
Tansy	<i>Tanacetum vulgare</i>	native	occasional
Teasel	<i>Dipsacus sylvestris</i>	nonnative	common
Timothy	<i>Phleum pratense</i>	nonnative	occasional
Tree of heaven	<i>Ailanthus altissima</i>	nonnative	common
Tulip	<i>Tulipa</i> spp.	nonnative	occasional
Tumblemustard	<i>Sisymbrium altissimum</i>	nonnative	common
Violet	<i>Viola</i> sp.	native	common
Virginia creeper	<i>Parthenocissus quinquefolia</i>	nonnative	occasional
Wheatgrass	<i>Agropyron elongatum</i>	native	occasional
Wild cucumber	<i>Echinocytis lobata</i>	native	uncommon
Willow	<i>Salix</i> sp.	native	occasional
Winter ve-tch	<i>Vicia villosa</i>	native	occasional
Wood's rose	<i>Rosa woodsii</i>	native	occasional
Yellow starthistle	<i>Centaurea solstitialis</i>	nonnative	common
Yucca	<i>Yucca glauca</i>	native	uncommon

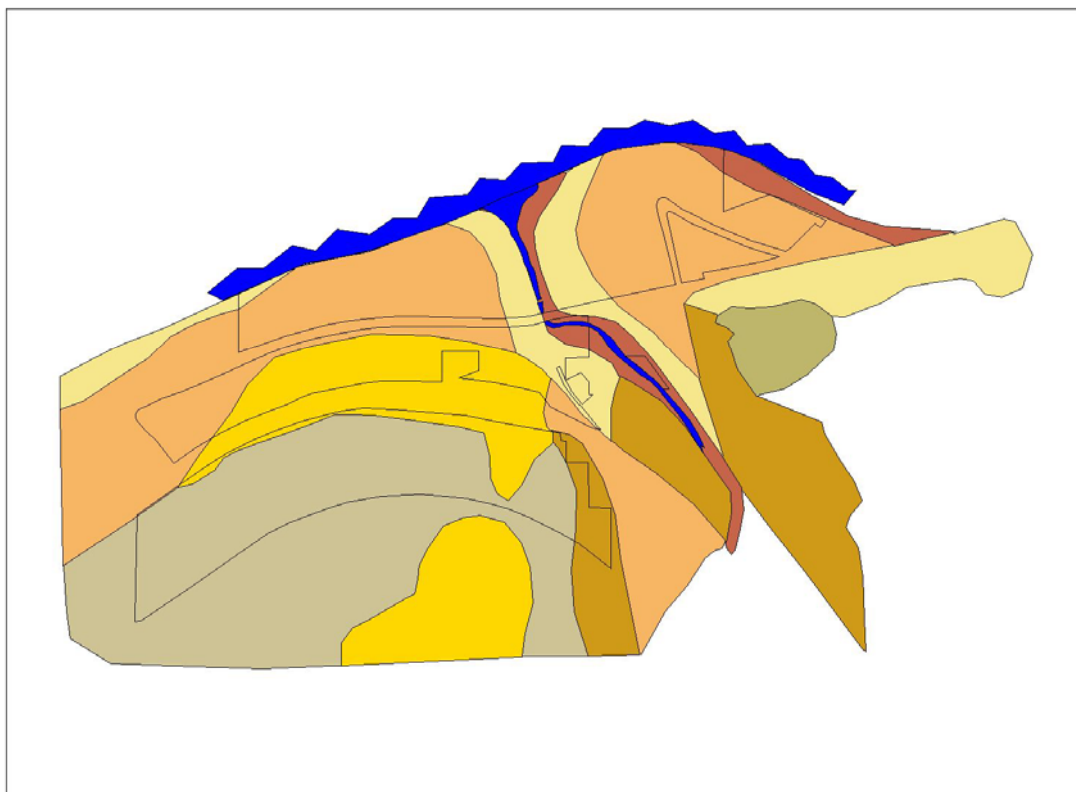


- Structures
- Transportation
- Park Roads
- Other Roads
- Highway 12
- Parking Areas
- Side walks
- Railroad
- Hydrology
- Vegetation Management Areas**
- Area 1
- Area 2
- Area 3
- Area 4
- Area 5
- Area 6
- Area 7
- Area 8
- Area 9
- Area 10
- Area 11
- Area 12
- Area 13
- Area 14
- Area 15
- Area 16
- Area 17
- Area 18
- Area 19
- Area 20

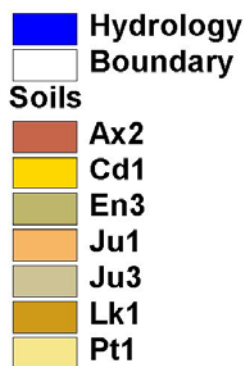


Spalding Vegetation Management Areas

Nez Perce National Historical Park GIS - 2002



0.4 0 0.4 0.8 Miles



Spalding Soils

WHITE BIRD BATTLEFIELD, IDAHO COUNTY; WHITE BIRD, IDAHO

SITE DESCRIPTION

OVERVIEW

The first battle of the Nez Perce War was fought at White Bird Battlefield on June 17, 1877. The battlefield is about 15 miles south of Grangeville, Idaho, between U.S. Highway 95 and the old White Bird Grade, approximately 0.5 miles from the town of White Bird, Idaho. The site occupies approximately 1,245 acres of sloping topography that retains much of the appearance it had in 1877. The surrounding land is used for agriculture. Some parcels with scenic views that are located outside the park are being subdivided for residential development. The views across the battlefield are excellent, with minor intrusions from ranches, residential structures and associated features such as roads and fences. Archeological sites and a few abandoned homestead remnants are also located on this site.

Most of the formal interpretation at this site takes place at a large pullout area and an interpretive shelter on U.S. Highway 95 that overlooks the battlefield. Exhibit panels inside the shelter describe events leading up to the battle and the U.S. Army and Nez Perce perspectives of the battle. Visitors can take an auto tour near the battlefield. Designated stops along the path are described in a brochure that provides information about the battle. This brochure allows visitors to see the battlefield from different perspectives. An interpretive trail (area 4) leads visitors onto the battlefield from the road along White Bird Creek.

The Old White Bird Grade is located on the east side of the battlefield, and U.S. Highway 95 is on the west side. The old grade is maintained as an alternate route. The

battlefield boundaries, established in 1965, included approximately 1,900 acres. The NPS owns approximately 1,245 acres and holds scenic easements on an additional 655 acres. A few parcels of land within the boundary are owned by either the State of Idaho or by private landowners.

MANAGEMENT OBJECTIVE FOR WHITE BIRD BATTLEFIELD

SITE MANAGEMENT OBJECTIVE

In keeping with the General Management Plan (National Park Service, 1997), the White Bird Battlefield has two zones with objectives for each one. These are as follows:

- The *historic zone* will be managed to approximate natural conditions and includes the actual battlefield site. It is delineated by White Bird Creek to the southeast, the park boundary that is parallel and just east of U.S. 95, the auto tour route and park boundary to the west and Poe Saddle to the north.
- The *developed zone* will be managed in as natural condition as possible and covers the pullout and interpretive shelter and additional signs adjacent to U.S. 95, the auto tour route, the interpretive trail and the site for the new visitor center facility (probably White Bird village/Price property area).

VEGETATION COMPOSITION

This site is very large so this management plan will focus on areas containing hiking trails and the area where an old homestead once stood. Many undesirable plant species grow throughout the site, including yellow starthistle (*Centaurea solstitialis*), spotted knapweed (*Centaurea maculosa*), Scotch thistle (*Onopordon acanthium*) and Canada thistle (*Cirsium arvense*), puncturevine (*Tribulus terrestris*), Dalmatian toadflax (*Linaria dalmatica*), medusahead (*Elymus caput-medusae*), teasel (*Dipsacus sylvestris*),

hound's tongue (*Cynoglossum officinale*) and field bindweed (*Convolvulus arvensis*). These plants should be controlled to permit establishing native plant species at the site. Due to the size of this site and the severity of the noxious plants, areas should be reclaimed in small manageable sections. After removal of the unwanted plants, these sections should be replanted as soon as possible to prevent new infestations of undesirable species.

The vegetation at this site is a mixture of various nonnative species as well as some native species that are being overtaken by the more prolific and vigorous noxious species (listed above). The site has several wetland areas and seasonal streams so herbicides should be carefully applied if used, and the wet areas should be avoided when spraying these chemicals. Manual removal of unwanted species will be necessary near water. Much of this site was heavily grazed in the past. Restoring the vegetation will be a challenge, will take many years, and be expensive.

The area where an old homestead was removed is covered with medusahead, teasel, Scotch thistle, hound's tongue and various other nonnative species (area 6). Various nonnative species were planted here such as plum, apricot (*Prunus* sp.) and black locust (*Robinia psuedoacacia*). Horehound (*Marrubium vulgare*) is found all over this site and probably escaped cultivation years ago. Black cottonwood (*Populus trichocarpa*) is probably the most abundant tree around the homestead area, although many are in poor condition and falling down. The noxious species and various other plants, such as black medic (*Medicago lupulina*), bulbous bluegrass (*Poa bulbosa*), chicory (*Cichorium intybus*), queen Anne's lace (*Daucus carota*), medusahead,

knotweed (*Polygonum aviculare*), pigweed (*Amaranthus* sp.) and wild oat (*Avena fatua*) will colonize bare soil in this area.

Along the stream to the east edge of area 6 are many dead or dying cottonwood trees as well as scattered clumps of hackberry (*Celtis reticulata*), hawthorn (*Crataegus* sp.), boxelder (*Acer negundo*), black locust, snowberry (*Symphoricarpos albus*) and blackberry (*Rubus* sp). The path leads to a well at the edge of the property, and the ground here contains various levels of old creek bed (area 6). The various brome and needle grasses are sparse, but rose (*Rosa* sp.), teasel, Scotch thistle, horehound, and hound's-tongue are abundant.

The interpretive trail (area 4), off of the old highway, has similar problem species that need to be controlled. Yellow starthistle and field bindweed are the most prolific noxious species, and steps to restore the vegetation must be made repeatedly to control all noxious species. The grasses in this area are a mixture of bluegrasses (*Poa* spp.), bulbous bluegrass, various brome grasses (*Bromus* spp.), intermediate wheatgrass (*Agropyron intermedium*), medusahead, needle and thread (*Stipa comata*), orchardgrass (*Dactylis glomerata*), and ventenata (*Ventenata dubia*). This list is incomplete and represents only a sample of the grasses present. Due to the starthistle competition, this area will need to be reclaimed in small sections so that the soil cleared from nonnative plants can be adequately covered with some native species.

Farther to the north along the old highway is another trail on an abandoned homestead (area 2), and the trail leads to a grove of trees below a small spring. This area is the old Swartz homestead. Swartz pond is to the southwest of this trail. Large areas of Canada thistle, teasel, yellow sweet clover (*Melilotus officinalis*), and yellow

starthistle intermixed among various grasses are present, although the grasses are sparse. A few of the native species present are blanket flower (*Gaillardia aristata*), yellow monkey-flower (*Mimulus guttatus*), cattail (*Typha latifolia*), Indian wheat (*Plantago patagonica*), lupine (*Lupinus* sp), silverleaf phacelia (*Phacelia hastata*), arrowleaf balsamroot (*Balsamorhiza sagittata*) and elderberry (*Sambucus cerulea*).

SOIL SURVEY INFORMATION

This site has twelve soil types (Barker, 1982). The average annual precipitation is about 16 inches, and the average air temperature is about 52°F, with about 170 to 180 frost-free days. The first three soils are Banner silt loams with slopes ranging from 3 to 25%. Banner silt loam (1) is on gentle slopes, 3 to 7%, and located on benches and long sloping ridges that are well drained and deep. The permeability is slow, the runoff is moderate, and the hazard of erosion is moderate. The design of roads and buildings should compensate for the shrink-swell potential of the soil and its inherent low strength. The soil is moderately calcareous and has a neutral pH. Banner silt loam (2) is found on 7 to 12% slopes and runoff is rapid, and the hazard of erosion is severe. Banner silt loam (3) is found on 12 to 25% slopes and the main hazard is erosion. For all three soil types above, the potential native vegetation is bluebunch wheatgrass (*Agropyron spicatum*). Trails and paths can be made in these soils, but the soil is dusty when dry.

Chard sandy loam (22) found on 12 to 25% slopes and stream terraces is very deep and well drained. The permeability and runoff are rapid in this soil, and slope is the main restriction. The hazard of erosion is severe, and this soil is strongly

calcareous. The pH is neutral in the surface layer and subsoil, but alkaline in the substratum.

Ferdinand-Bluesprin (44) is a very cobbly loam and is found on slopes of 40 to 90%. The slopes are often south facing soils on canyonsides. The soil is moderately deep and well drained. The average precipitation is 22 inches, and the average temperature is 47°F, with a frost-free period of about 135 to 140 days, due to the increase in elevation. The permeability is slow in the Bluesprin part, the runoff is rapid, and the hazard of erosion is severe. The pH is slightly acidic to neutral. The potential native vegetation is mainly bluebunch wheatgrass, Idaho fescue, lupine, and arrowleaf balsamroot on the Ferdinand soil and bluebunch wheatgrass and Idaho fescue on the Bluesprin. The very steep slope is the main limitation of these soils.

The Ferdinand-Riggins complex (46) is similar to Ferdinand-Bluesprin except the slope is from 7 to 40% consisting of moderately sloping to steep soils on elevated plateaus. This soil is silt loam to silt clay loam and has a severe to very severe hazard of erosion.

The next two soils are Lawyer-Bluesprin (74) and Lawyer-Tannahill (75) associations with 40 to 90% slopes that are convex soils on canyonsides. The Lawyer soil is a very deep and well-drained silt loam with slow permeability and very rapid runoff. Its pH is neutral. The native vegetation is mainly Idaho fescue, bluebunch wheatgrass and many forbs on the Lawyer soil, but the Bluesprin vegetation consists of mainly the grasses. Lawyer soil is north facing, and the Bluesprin and Tannahill are south facing. The main limitations are the steepness of the slope and the severe hazard of erosion.

Lickskillet-Tannahill soil complex (76) is found on slopes of 7 to 40%. It is gently sloping to steep, south-facing soils of gravelly clay loam to loam. Permeability is moderate, and runoff is rapid to very rapid making the hazard of erosion severe to very severe. The Lickskillet soil is shallow and the Tannahill soil is deep, and both are well drained. The Tannahill soil is moderately alkaline. The main restrictions are the depth to rock and the rock fragments in the soil. The steep slope and severe hazard of erosion cause some limitations also. The next soil is Tannahill loam (112) and is similar to the above complex without the Lickskillet portion. The Tannahill-Lickskillet soil (113) is the same as the above Lickskillet-Tannahill complex, except more of the deep, well-drained Tannahill soil is present than the Lickskillet soil.

The last soil type is called Typic Xerofluvents (119) and is noted as being a broadly defined mapping unit. These soils are mixed and unconsolidated materials that have been deposited by streams or other drainage ways on the low terraces and floodplains along stream channels. A mixture of sand, gravel, cobbles and some fine material make up these areas. Slopes are generally less than 20% but can be as much as 40% on fans at the mouth of streams and drainageways. This soil is used mainly for wildlife habitat, and recreational use is limited by the cobbles in the surface layer.

LANDSCAPE PLAN

RECOMMENDATIONS FOR CONTROL OF NOXIOUS PLANTS

To reclaim this site, removal of noxious species, such as yellow starthistle, spotted knapweed and Canada thistle, will be important throughout all areas of the site. Various small areas of nonnative species should be removed and replanted with native grasses and forbs. Removal of the unwanted species manually, by burning, or with the

use of herbicides may require repeated treatments to gain control. The use of various control methods will be more effective than using a single type of control.

In order to control the spread of noxious species, these plants should be removed before seed set, and the site should be checked monthly for new infestations. The most important plants to control are yellow starthistle, Scotch and Canada thistles, puncturevine, Dalmatian toadflax, medusahead and bindweed. Teasel, sweet clover and rose plants in all areas as well as water smartweed (*Polygonum amphibium*) (area 2) are potential problems if left to proliferate. These plants should be removed or at least prevented from setting seeds. As these species are removed, the areas should be replanted with native plant species adapted to the site, such as those suggested in the revegetation section.

Weed removal methods that are environmentally friendly are mechanically removing undesirable species or releasing biological control insects to inhibit plant proliferation. Mechanical removal by hand pulling or hoeing is effective but needs to be done monthly to get the sprouts from pieces of root left in the ground or seeds that may germinate after the soil is disturbed. Biocontrol insects may be slow to establish, but some have shown good long-term control.

Some research has been done in range management using livestock to graze down the unwanted species and incorporate seeds of a more desirable species. Unfortunately, the species used are generally nonnative range grass species. The Salmon River Weed Management Area project is a group of public and private agencies and concerned landowners that have developed a plan to control noxious plant species in the Salmon River area. They have implemented some experimental management

strategies and should be consulted for the current status of their efforts and future information. Contact can be made through Idaho County Weed Control or the Nez Perce National Forest, and both offices are in Grangeville. Mark Stannard, Plant Materials Center (NRCS Plant Materials Center, 2001) located in Pullman, Washington, is presently doing research using native grass species, such as bluebunch wheatgrass, in a competition control experiment for yellow starthistle.

Mechanically removing (i.e., hoeing or hand pulling) the Scotch thistle, yellow starthistle, and spotted knapweed along the trails will start the process of reclaiming the site (areas 2, 4 & 6). This procedure would be the best and safest method of controlling all noxious plants that are near wetland areas or the borders of the various streams. Protective clothing and gloves should be worn when manually removing these plants as they have thorns and alkaloids that can cause skin irritation. The Canada and Scotch thistles should be cut down before the seed matures to prevent further spread (all areas). Canada thistle is a perennial plant, and treatments must be repeated to obtain control. Scotch thistle is biennial so preventing seed production will reduce the population.

For Canada thistle, crown/root weevils (*Ceutorhynchus litura*), seed head weevils (*Rhinocyllus conicus*), and stem gallflies (*Urophora cardui*) are biocontrol insects that have worked in Oregon, and they may work here. Biocontrol agents for field bindweed are a bud and leaf gall mite (*Aceria malherbae*) and a defoliating caterpillar of the moth (*Tyta luctuosa*). Biocontrol insects that could be present on spotted knapweed are seed head gall flies (*Urophora affinis* and *U. quadrifaciata*), seed head weevils (*Larinus minutus* or *L. obtusus*) and seed head moth (*Metzneria paucipunctella*). Biocontrol

insects for yellow starthistle that have been released in the area and could be present at this site are seedhead weevils (*Bangasternus orientalis* or *Eustanopus villous*), seedhead gall fly (*Urophora sirunaseua*), and a seedhead fly (*Chaetorellia australis*). The Pacific Northwest Weed Control Handbook (William et al., 2001) is updated annually and should be checked yearly for revisions, as other biocontrol insects may become available.

A chemical method of controlling Canada thistle is spot treating with Roundup™ as soon as the plants are actively growing as the stem elongates, but before flowering. To control field bindweed, spot treat with Roundup™ or 2,4-D™, following the label directions; plants in early bud to full bloom are effected severely. As new sprouts or seedlings emerge, they can be pulled manually or retreated with one of the recommended herbicides. Dalmatian toadflax can be treated with picloram (Tordon™). Puncturevine and teasel can be spot treated with 2,4-D amine and Scotch thistle with dicamba, (Banvel™). Yellow starthistle has been controlled with 2,4-D LV ester. These herbicides are just a few of the chemical controls available, and others may be used. Herbicide use should be limited and avoided near waterways. For safety, always follow label precautions and directions. The Pacific Northwest Weed Control Handbook (see William et al., 2001) should be checked annually for new information on weed control techniques and alternatives. Care must be taken to avoid spraying herbicides on other nontarget plants, and herbicide treatments may be unfavorable to the beneficial insects if they are released as biocontrol agents. The use of herbicides should be limited to areas away from native species or where these species will be planted as well as away from waterways. Hand pulling in areas where herbicides could damage other species

or in wetlands or riparian zones is recommended. Due to the large numbers of yellow starthistle plants in certain areas of the site, only the perimeter of infested areas should be treated with herbicide to limit the spread.

The best weed control is achieved by employing a combination of all methods (Integrated Pest Management). If herbicides are used, the class of herbicide should be rotated seasonally to prevent herbicide resistance by some weed species. Minimal control would involve preventing seed set and dispersal of all unwanted species by removing seed heads monthly or as they appear. All areas of this site should be visually monitored throughout the growing season for new infestations of noxious plants, and they should be removed when found.

The black locust trees in area 6 should be removed to prevent them from spreading. Cutting the stumps and applying 25% Garlon™ 4 (triclopyr) and 75% basal oil (by volume) to the cut surface is effective during spring and summer. Subsequent sprouts can be killed using 6.25% glyphosate in water (Prather, 2001). See the Recommendations for Control of Noxious Plants in the Canoe Camp section for detailed directions on using Garlon™ 4 on cut stumps of black locusts

REVEGETATION RECOMMENDATIONS

Various trees on the site, such as the cottonwood trees near the old homestead and along the creek (area 6), are in poor condition and should be removed. Established trees or cuttings of cottonwood from this area should be planted to replace some of the removed trees. Cuttings of golden currant (*Ribes aureum*) could also be added to this area as well as some forbs and grasses. Forbs that should grow well at this site are

lupine (*Lupinus* sp.), arrowleaf balsamroot, blanket flower, sunflower (*Helianthus annuus*) and yarrow (*Achillea millefolium*).

A mixture of native grass species that would grow well and enhance the site are listed in Grass Seed Mixture #2 shown in Appendix A. Overseeding with this native grass mixture will help keep the unwanted species in check. The seed mixture should be applied at a rate of 15 to 20 lb. per acre in areas that are bare and broadcast by hand in smaller areas where some plants are present. Sedges (*Carex* spp.) and other forbs, such as arrowleaf balsamroot and yellow monkey-flower, could also be added to areas that are wet in the spring (areas 2 & 6).

HAZARD TREE RECOMMENDATIONS

The term hazard tree refers to a tree that presents some sort of hazard to a person or building. Taking appropriate action is very important in situations that involve the safety of visitors and may present a liability. All trees should be assessed on a yearly basis for broken or hanging limbs. Shrubs should be examined for damaged branches that may be walked into or otherwise endanger a visitor. Various nonnative species were planted around the old homestead (area 6) and should be checked annually for dead limbs or diseased wood. The apricot and plum trees should be pruned to remove hazard limbs or removed if the plants are diseased or in poor condition. All trees that are kept at the site should be checked for disease and dead limbs. To improve the health of the trees on the site, the need for pruning should be assessed annually. The shrubs along U.S. Highway 95 at the interpretive shelter should be checked every two weeks for broken limbs and dead wood. The dead limbs should be removed when seen anytime of the year. A certified arborist should be

contracted to inspect each tree annually on the entire site. Structural integrity and potential hazards should be evaluated for each tree. Trees that are down on the ground or standing dead should be removed when seen.

ROUTINE LANDSCAPE MAINTENANCE RECOMMENDATIONS

The old homestead area where the buildings were removed (area 6) should be maintained as a recreational meadow area. Mowing the grasses should be minimized with mowing completed only once per year. The mowing height should be six inches at the lowest. This area could be aerated for the first two years to improve the vigor of the existing grasses and prepare a seed bed for overseeding with native grasses. Aerating may be needed only once a year, depending on the amount of foot traffic on the grassy areas. See the Routine Landscape Maintenance Recommendations in the Canoe Camp section for a description of aeration benefits and procedures.

As the process of removing unwanted noxious species starts, the site will benefit from planting native grass seeds and established plants (plugs). Mature native grasses often out-compete most nonnative broadleaf plants when mowed to a height of six inches once a year in late summer after the seeds have filled out. This minimal mowing will allow the grasses to set seed and be dispersed. The site should be monitored monthly for new nonnative plants, and manual removal will be necessary until the native grasses are established. The village site parking area and interpretive trails can be mowed up to twice a year, but grasses should be mowed at a six-inch height or higher. The village parking site should be mowed as close to June 17 as possible, before the commemoration. The interpretive trails should also be mowed at a height close to 6 inches for hiking safety (rattlesnake problems).

The west boundary of the site is U.S. Highway 95 and the east boundary is the Old White Bird road. Both of these boundaries should be checked monthly for unwanted plant infestations and for debris that might carry nonnative species seeds onto the site. Various tumbleweeds that will carry seed a long distance are present and should be collected and bagged for removal.

SUMMARY

The most important goal for maintaining this site is to prevent yellow starthistle from spreading and later to reduce the amount of acreage infested with this noxious species. Another important goal is to prevent infestation of the site with new or other nonnative species, particularly invasive species. To be effective, various control methods, including manual removal, will need to be used monthly on yellow starthistle and other noxious species, starting first in small areas at the site. Once native grass species are established in a treated area, reclamation can begin on other small areas infested with noxious species. During the growing season, the site will have to be visually monitored each month to catch any new infestations of unwanted species due to site access by a major highway. By using all methods of noxious plant control and replanting with native species, the site will have a more natural appearance and should be appealing to visitors.

Another important aspect of maintaining this site is to evaluate annually the various large trees near the homestead site. Some of these trees have poor structural integrity, and parts of the trees or entire trees should be removed. Making sure these trees are healthy and structurally sound will ensure the safety of visitors and employees at this part of the site.

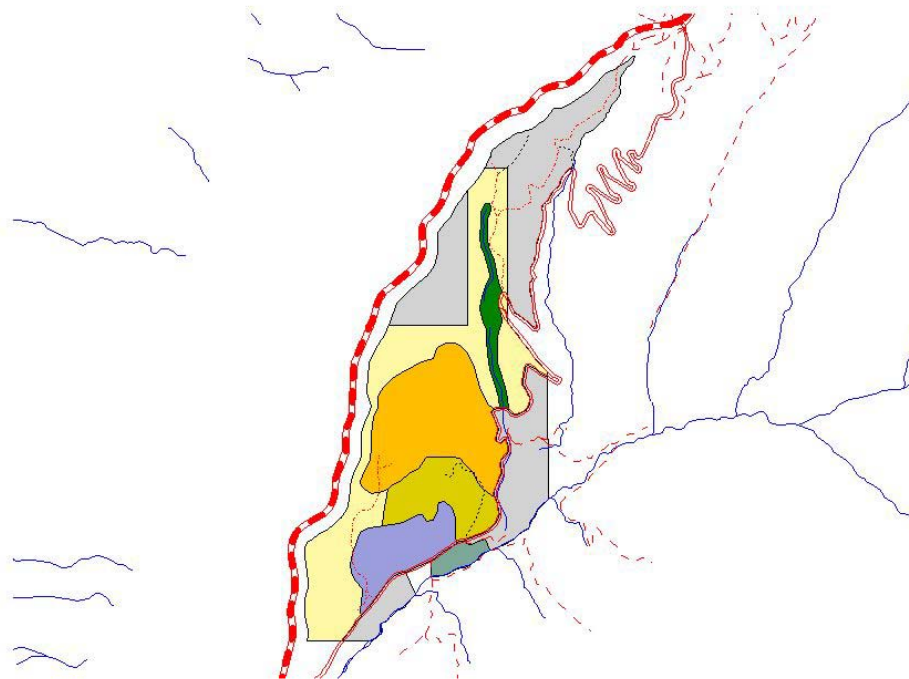
VEGETATION COMPOSITION

White Bird Battlefield Idaho County

White Bird, Idaho

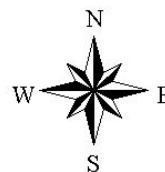
Common name	Scientific name	Native/nonnative	Abundance
Alfalfa	<i>Medicago sativa</i>	nonnative	uncommon
Annual beardgrass	<i>Polypogon monspeliensis</i>	nonnative	occasional
Apricot	<i>Prunus</i> sp.	nonnative	uncommon
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	native	occasional
Bedstraw	<i>Galium</i> sp.	nonnative	uncommon
Blackberry	<i>Rubus</i> sp.	nonnative	occasional
Black locust	<i>Robinia psuedoacacia</i>	nonnative	occasional
Black medic	<i>Medicago lupulina</i>	nonnative	common
Blanket flower	<i>Gaillardia aristata</i>	native	uncommon
Bluegrass	<i>Poa</i> spp.	nonnative	occasional
Boxelder	<i>Acer negundo</i>	native	uncommon
Buckhorn plantain	<i>Plantago lanceolata</i>	nonnative	occasional
Bulbous bluegrass	<i>Poa bulbosa</i>	nonnative	common
Burdock	<i>Arctium</i> sp.	nonnative	common
Canada thistle	<i>Cirsium arvense</i>	nonnative	common
Cattail	<i>Typha latifolia</i>	native	occasional
Charming barley	<i>Hordeum leporinum</i>	nonnative	common
Cheatgrass	<i>Bromus</i> spp.	nonnative	common
Chicory	<i>Cichorium intybus</i>	nonnative	common
Cottonwood	<i>Populus trichocarpa</i>	native	common
Curly cup gumplant	<i>Grindelia squarrosa</i>	native	uncommon
Curly dock	<i>Rumex crispus</i>	nonnative	occasional
Dalmation toadflax	<i>Linaria dalmatica</i>	nonnative	common
Elderberry	<i>Sambucus cerulea</i>	native	uncommon
Erect cinquefoil	<i>Potentilla recta</i>	nonnative	occasional
European corn-salad	<i>Valerianella locusta</i>	nonnative	occasional
Fiddleneck tarweed	<i>Amsinckia retrorsa</i>	nonnative	occasional
Field bindweed	<i>Convolvulus arvensis</i>	nonnative	occasional
Foxtail barley	<i>Hordeum murinum</i>	nonnative	common
Golden currant	<i>Ribes aureum</i>	native	occasional
Hackberry	<i>Celtis reticulata</i>	native	occasional
Hawthorn	<i>Crataegus</i> sp.	native	occasional
Horehound	<i>Marrubium vulgare</i>	nonnative	occasional
Horsetail	<i>Equisetum arvense</i>	native	uncommon
Hound's-tongue	<i>Cynoglossum officinale</i>	nonnative	occasional
Indian wheat	<i>Plantago patagonica</i>	native	occasional
Intermediate wheatgrass	<i>Agropyron intermedium</i>	nonnative	occasional
Knotweed	<i>Polygonum aviculare</i>	nonnative	occasional

Kochia	<i>Kochia scoparia</i>	nonnative	common
Lupine	<i>Lupinus</i> sp.	native	occasional
Mallow	<i>Malva neglecta</i>	nonnative	occasional
Medusahead	<i>Elymus caput-medusae</i>	nonnative	common
Moth mullein	<i>Verbascum blattaria</i>	nonnative	occasional
Mullein	<i>Verbascum thapsus</i>	nonnative	common
Mustard	<i>Brassica</i> spp.	nonnative	common
Needle and thread	<i>Stipa comata</i>	native	common
Orchardgrass	<i>Dactylis glomerata</i>	nonnative	occasional
Pennycress	<i>Thlaspi arvense</i>	nonnative	occasional
Pigweed	<i>Amaranthus</i> sp.	nonnative	occasional
Plum	<i>Prunus</i> sp.	nonnative	occasional
Plumed clover	<i>Trifolium plumosum</i>	native	uncommon
Poplar	<i>Populus</i> sp.	native	occasional
Puncturevine	<i>Tribulus terrestris</i>	nonnative	occasional
Purslane	<i>Portulaca oleracea</i>	nonnative	occasional
Queen Anne's lace	<i>Daucus carota</i>	native	uncommon
Rush	<i>Juncus</i> spp.	native	occasional
Salsify	<i>Tragopogon dubius</i>	nonnative	occasional
Scotch thistle	<i>Onopordon acanthium</i>	nonnative	common
Sedge	<i>Carex</i> spp.	native	uncommon
Serviceberry	<i>Amelanchier</i> sp.	native	uncommon
Sheep sorrel	<i>Rumex acetosella</i>	nonnative	occasional
Silverleaf phacelia	<i>Phacelia hastata</i>	native	occasional
Snowberry	<i>Symphoricarpos albus</i>	native	occasional
Spotted knapweed	<i>Centaurea maculosa</i>	nonnative	occasional
St. John's wort	<i>Hypericum perforatum</i>	nonnative	occasional
Sumac	<i>Rhus glabra</i>	native	occasional
Sunflower	<i>Helianthus annuus</i>	native	occasional
Tamarix	<i>Tamarix ramosissima</i>	nonnative	uncommon
Teasel	<i>Dipsacus sylvestris</i>	nonnative	common
Ventenata	<i>Ventenata dubia</i>	nonnative	common
Vetch	<i>Vicia agustifolia</i>	nonnative	occasional
Water smartweed	<i>Polygonum amphibium</i>	native	occasional
Water speedwell	<i>Veronica anagallis-aquatica</i>	native	occasional
Wild oat	<i>Avena fatua</i>	nonnative	occasional
Wild rose	<i>Rosa</i> sp.	native	occasional
Witchgrass	<i>Panicum capillare</i>	native	occasional
Yarrow	<i>Achillea millefolium</i>	native	occasional
Yellow monkey-flower	<i>Mimulus guttatus</i>	native	occasional
Yellow starthistle	<i>Centaurea solstitialis</i>	nonnative	common
Yellow sweet clover	<i>Melilotus officinalis</i>	nonnative	common



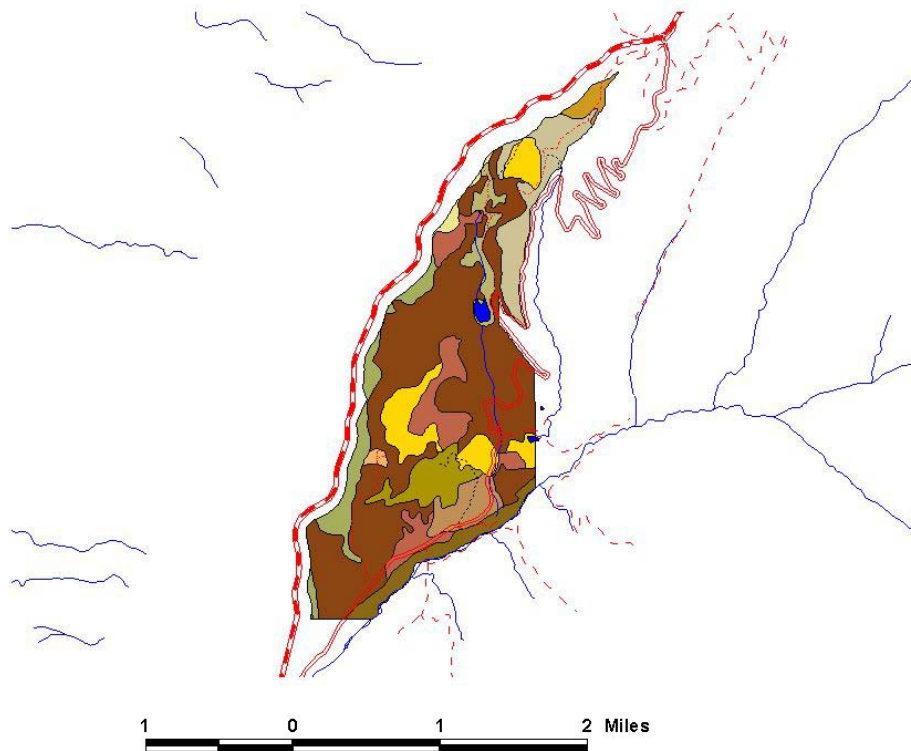
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- Roads & Trails**
- Trails
 - Hwy 95
 - Old Hwy 95
 - Private Roads
 - Abandoned Jeep Roads
- Water Bodies**
- Streams
- Vegetation Management Areas**
- Area 1
 - Area 2
 - Area 3
 - Area 4
 - Area 5
 - Area 6
 - Non-NPS

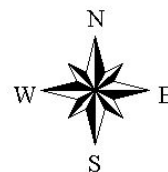


White Bird Battlefield Vegetation Management Areas

Nez Perce National Historical Park GIS - 2002



- Roads & Trails**
- Trails
 - Old Hwy 95
 - Private Roads
 - Abandoned Jeep Roads
 - Hwy 95
- Water Bodies**
- Streams**
- Soils**
- Banner silt loam (1)
 - Banner silt loam (2)
 - Banner silt loam (3)
 - Chard sandy loam 12-25% slopes
 - Ferdinand-Bluesprn
 - Ferdinand-Riggins complex
 - Lawyer-Bluesprn association
 - Lawyer-Tannahill association
 - Licksillet-Tannahill
 - Tannahill loam 7-40% slopes
 - Tannahill-Licksillet complex
 - Tannahill-Rock outcrop complex
 - Typic Xerofluvents



White Bird Battlefield Soils

Nez Perce National Historical Park GIS - 2002

MONTANA UNIT

BEAR PAW BATTLEFIELD, BLAINE COUNTY; CHINOOK, MONTANA

SITE DESCRIPTION

OVERVIEW

Bear Paw Battlefield, a national historic landmark, is about 16 miles south of Chinook, Montana, along Cleveland Road (County Highway 240). This battlefield is the site of the surrender of the nontreaty Nez Perce at the end of their 1877 flight. The locations of events that occurred during the 1877 attack, siege, and surrender form the primary historical resources at the site. The landscape has remained relatively undeveloped up to the present time. Some features associated with the events of 1877 are on approximately 250 acres of private agricultural land surrounding the 190 acres that the National Park Service leases from the state of Montana.

A series of nine low mounted wayside exhibits are dispersed around the battlefield's 0.75-mile interpretive trail. The waysides outline the story of the battle. Monuments placed by various groups dot the landscape. A trail guide is available that has text keyed to numbered stops along the trail. Ranger-guided walks are available in summer.

The Chinook Chamber of Commerce leases office space to the NPS, and the Blaine County Museum in Chinook, Montana, has devoted one of its exhibit rooms to the Bear Paw Battle. A sophisticated 20-minute audiovisual presentation on the war of 1877 is also available in the museum's auditorium.

MANAGEMENT OBJECTIVE FOR BEAR PAW

SITE MANAGEMENT OBJECTIVE

In keeping with the General Management Plan (National Park Service, 1997), the Bear Paw Battlefield has two zones with objectives for each one. These are as follows:

- The *historic zone* will be managed to approximate natural conditions and includes the actual battlefield site.
- The *developed zone* will be managed in as natural condition as possible and covers the parking lot, interpretive trail, wayside exhibits, picnic tables and shelter, wind-sheltered benches, pit toilet and a visitor facility.

VEGETATION COMPOSITION

This site consists of dry sagebrush hillsides (areas 1 & 3) and a riparian area (area 2) that follows Snake Creek through the property. The dry hillside from County Highway 240 east to the trail head (area 1) contains a mixture of native and nonnative grasses. This area has the parking lot, restroom, and picnic shelter, and the area is mowed regularly and receives the most foot traffic. Native species such as prairie Junegrass (*Koeleria cristata*), thickspike wheatgrass (*Agropyron dasystachyum*), blue grama (*Bouteloua gracilis*), needle and thread (*Stipa comata*) and Sandberg bluegrass (*Poa sandbergii*) are found in the unmowed areas adjacent to the mowed areas. Some nonnative grass species present are smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), oat (*Avena* sp.) and foxtail (*Hordeum* sp.). Sage (*Artemisia* sp.), lupine (*Lupinus* sp.), vetch (*Astragalus* sp.), flax (*Linum perenne*), prickly pear cactus (*Opuntia polyacantha*), pin cushion cactus (*Mamillaria vivipara*), blanketflower (*Gaillardia aristata*) and penstemon (*Penstemon* sp.) are some of the

native forbs found intermixed with the grasses (areas 1 & 3). Nonnative species present in all areas of the site are Canada thistle (*Cirsium arvense*), prickly lettuce (*Lactuca serriola*), field bindweed (*Convolvulus arvensis*), kochia (*Kochia scoparia*), russian thistle (*Salsola kali*) and rush skeleton-weed (*Lygodesmia juncea*). Species escaped from cultivation and found along the trail throughout the site are white and yellow sweet clovers (*Melilotus* spp.) and alfalfa (*Medicago sativa*).

Along Snake Creek (area 2), the willow (*Salix exigua*) and various roses (*Rosa acicularis*, *R. arkansana* or *R. woodsii*) have become overgrown due to fire suppression. Where the trail crosses the creek other native species, such as currant (*Ribes* sp.), snowberry (*Symphoricarpos alba*), buttercup (*Ranunculus* sp.), horsetail (*Equisetum* sp.), stinging nettle (*Urtica dioica*), milkweed (*Asclepias speciosa*), blue-eyed grass (*Sisyrinchium montanum*) and cattail (*Typha latifolia*) are growing. Reed canarygrass (*Phalaris arundinacea*), curly dock (*Rumex crispus*), field bindweed and Canada thistle are nonnative species in area 2. An uncommon boxelder (*Acer negundo*) and cottonwood (*Populus* sp.) trees are also scattered along the creek.

The loop trail passes by various marked sites of historic interest and has vegetation similar to area 1. Monuments to those lost in the battle are found along the trail, and the ground around them is worn (area 3). The vegetation in these areas is sparse, and erosion could become a problem. Another trail branches off the loop trail to the north and leads to a rocky cliff area called Death's Point of Rocks (area 3). This trail has some erosion problems and is sparsely vegetated. Buckwheat (*Eriogonum* sp.), scarlet globemallow (*Sphaeralcea coccinea*), arnica (*Arnica cordifolia*), blanketflower and cactus are some of the native species present that should be protected here as well

as in all areas. Below Death's Point of Rocks, the ground seems to have been disturbed or excavated in the past, and the vegetation is sparse.

SOIL SURVEY INFORMATION

Twelve soil types are present on this site (Hilts, 1986). The average annual air temperature is 42°F, and the frost-free season is about 110 days. The average annual precipitation ranges from 15 to 19 inches. The first five soil types are various clay loams with slopes ranging from 0 to 8%. The first soil, Bear Paw clay loam (13) has slow permeability and slow surface runoff. The hazard of wind erosion is moderate, and water erosion hazard is slight. Small enclosed basins that are subject to ponding have a high sodium content and limit the plant species that will grow here. The potential natural grass community is Idaho fescue (*Festuca idahoensis*), green needlegrass (*Stipa viridula*), bluebunch wheatgrass (*Agropyron spicatum*), giant wildrye (*Elymus cinereus*), prairie Junegrass, and sedges (*Carex* spp.). White and golden willows (*Salix* spp.), ponderosa pine (*Pinus ponderosa*), Colorado spruce (*Picea pungens*), Rocky Mountain juniper (*Juniperus scopulorum*) and Douglas fir (*Pseudotsuga menziesii*) are suitable trees except in the sodium affected areas. Native shrubs and small trees that are suitable are chokecherry (*Prunus virginiana*), American plum (*Prunus americana*), thorny buffaloberry (*Shepherdia canadensis*), snowberry, and big sagebrush (*Artemisia tridentata*).

The next two soils are Bear Paw-Elloam clay loam on slopes of 0 to 4% (14), which is deep and well drained, and Bear Paw-Elloam clay loam on slopes of 4 to 8% (15) with medium surface run off. Both are dense clay that is subject to crusting and becomes dry and hard, restricting root and water penetration. This characteristic is

common in sodium-affected soils, which will need sodium-resistant species like Nuttall alkaligrass (*Puccinellia nuttalliana*), saltbush (*Atriplex* sp.) and greasewood (*Sarcobatus vermiculatus*). This soil (15) has a moderate hazard of wind and water erosion due to the density of the clay. The last two Bear Paw type clay loams are Bear Paw-Vida with slope of 0 to 4% (16) and Bear Paw-Vida with a slope of 4 to 8% (17). The Vida clay loam is a deep and well-drained soil found on upper slopes. The permeability is slow limiting soil drainage, and the available water capacity is high.

Farnuf loam (44) with a slope of 2 to 4% is a deep and well drained soil on alluvial fans and stream terraces. This soil is moderately permeable making the available water capacity high. A slight hazard of wind erosion exists on this soil type without vegetation.

The Korent-Nesda complex (75) is a deep and well drained soil that is nearly level on stream terraces and flood plains. Permeability is moderate to 11 inches and rapid below this depth in the soil. Gravelly sand at a depth of 20 inches can cause drought like conditions. The runoff is slow, and spring flooding is a hazard.

Straw-Korent loam (116) is also nearly level on the flood plains and stream terraces with gravelly Nesda at the stream edges. This soil is moderately permeable with slow run off making the available water capacity high. The Straw is a deep, well-drained loam to silt loam with a slight hazard of water erosion and a moderate hazard of wind erosion. This soil is also subject to rare flooding.

Typic Ustifluvents (130) is deep, moderately to poorly drained loam to clay loam in the bottom lands, narrow valleys, and drainage ways. These soils can be nearly level to gently sloping or even multilevel terraces with short, steep slopes. In the event of

high seasonal runoff, flooding could be a hazard. This soil is dissected by stream channels and drainage ways and has a slow to moderate runoff. The hazard of wind and water erosion is moderate. The potential plant community is similar to the one given for the first five soils.

The Vida-Zahill clay loam (136) is located on strongly rolling hills with slopes ranging from 8 to 15%. The Vida is a deep, silty clay loam that is well drained on the lower parts of the slopes. Slow permeability and moderate to rapid runoff make water erosion a severe hazard. Wind erosion is a moderate hazard.

The Zahill clay loam (150) is similar to Vida-Zahill except that the former soil type is located on the ridges and knolls. Wind and water erosion are the main limitations, and calcareous areas can be found in this soil. This soil can be improved by adding phosphate fertilizer. The upland slopes made of Zahill clay loam are steep, 25 to 45% grade changes. This soil is well drained, has a slow permeability and rapid runoff. The hazard of wind erosion is moderate, but water erosion can be a severe hazard due to the steep slopes. Rough fescue (*Festuca scabrella*), bluebunch wheatgrass and little bluestem (*Andropogon scoparius*) are suitable plants for this soil. Thin soil and steep hills limit the use of trees or shrubs.

The last soil is Zahill-Vida clay loam (151) with slopes of 15 to 35%. The steep, hilly slopes make runoff rapid and water erosion a severe hazard, but wind erosion is moderate. The Vida soil is deep and well drained on the slopes below knolls and ridges.

LANDSCAPE PLAN

RECOMMENDATIONS FOR CONTROL OF NOXIOUS PLANTS

The species considered noxious or invasive on this site are Canada thistle, field bindweed, prickly lettuce, skeleton-weed, Russian thistle, and kochia. These species could present a problem if left uncontrolled in all areas. Although this site has a limited quantity of these species, their proliferation should be prevented. Manual removal would be the safest method of control to ensure protection of the native species present and prevent herbicide contamination of Snake Creek. Weekly rounds of the trails, parking lot and picnic area should be made and all unwanted species pulled or dug out and bagged for removal from all areas. Plants should be removed from the site as seed dispersal and sprouts from plant parts left on the ground can spread these unwanted species. Species escaped from cultivation that should also be controlled are white and yellow sweet clover and alfalfa in all areas. If these species are removed before flowering, the plants may be left on the ground to decompose. Reed canarygrass, bindweed and curly dock are other nonnative species that should be controlled in area 2. Annual burning to remove excess plant matter and seeds can control Reed canarygrass. Field bindweed should be prevented from setting seed and should be hand pulled in all areas. Weekly visual monitoring and pulling will be necessary if complete removal is unsuccessful. Curly dock has a deep tap root and may be difficult to remove, so preventing seed set and dispersal will be important in controlling this species in all areas. Removing the seed head before it dries would prevent dispersal.

Biocontrol insects are available for Canada thistle, field bindweed and skeleton-weed, but at this stage the supply of host plant material may limit the success of the

insect. Questions about noxious weeds can be directed to the local weed district (see <http://mtwow.org> for contact information) or to the Montana State Weed Coordinator, Barbara Mullin, Montana Dept. of Ag. (Mullin, 2002). The use of herbicides should be limited to infestations of noxious species that escape manual removal. This site lacks extremely large areas of invasive species, so herbicide use is probably unnecessary at this time.

REVEGETATION RECOMMENDATIONS

As unwanted species are removed, any exposed soil created by removing plants should be planted with native species. A mixture of native grasses that tolerate dry conditions should be planted to enhance the site. The recommended mixtures are Grass Mixture #3 for the hilltops and Grass Seed Mixture #4 for the hill slopes and bottom areas. Both grass mixtures are described in Appendix A. The goal is to avoid overseeding with a mixture of grasses that could change the natural composition of the native species. The mixtures can be applied at a rate of 15 to 20 lb. per acre. This rate can be doubled on steeper terrain (Mark Mustoe, 2001). A couple species of grass plugs or established grass plants (both commercially available) that would grow well at this site are thickspike wheatgrass, and prairie Junegrass. Forb plants that would grow well on the dry hillsides (areas 1 & 3) are low goldenrod (*Solidago missouriensis*), wild bergamot (*Monardia fistulosa*), arnica (*Arnica cordifolia*), and buckwheat. Species present that could be propagated by seeds for use in other areas of the site are evening primrose (*Oenothera biennis*), blue flax (*Linum perene*), goldenweed (*Haplopappus armeroidus*), woolly pussytoes (*Antennaria lanata*), lupine, and blanketflower. Native shrubs that would be appropriate for dry areas, such green rabbitbrush (*Chrysothamnus*

viscidiflorus), could be included with any of the forbs mentioned where large areas of ground have been disturbed.

In the riparian area along the creek (area 2) where unwanted plants are removed, native species should be planted to cover the disturbed soil. Milkweed (*Asclepias speciosa*) could be planted in areas between the very wet zone and the wet to dry meadow.

A native tree that tolerates wet conditions, such as cottonwood, could be planted at this site. Red osier dogwood (*Cornus stolonifera*) is a native shrub that tolerates moist soil. These species could be planted where dead or dying willow trees are removed to add more diversity.

HAZARD TREE RECOMMENDATIONS

All of the trees within close proximity of the trails need to be checked at least annually for dead or damaged limbs. This procedure will be important in all areas of the park to ensure the safety of the visitors and employees. The trees should be checked for conks, fungal fruiting bodies, growing on them, which indicates that decay organisms are growing within the trees. Trees that have structurally weak limbs or lack proper care (e.g., pruning) should be pruned to improve their health. A certified arborist should be contracted once a year to examine all trees on the site. The arborist should examine trees in questionable health to ensure they are structurally sound and to minimize the hazards of falling limbs and trunks. Removal of dead or dying trees should improve the health of the other trees present.

ROUTINE LANDSCAPE MAINTENANCE RECOMMENDATIONS

Mowing should be minimal and preferably only after seeds have been set to allow the grasses to become better established. The amount of mowing necessary will vary with the amount of rainfall. When conditions are dry, mowing once a year will be sufficient, and during years with higher than average rainfall, mowing twice a year may be required. The mowing height for the grasses in any area should be no shorter than six inches. Mowing along the trail loop should be reduced to a narrow strip three to four feet wide. To improve the grass density and health, mowing the arrival area and trails should be limited to once a year after seed has filled out. The pathways that are mowed and have considerable foot traffic could benefit from annual aeration.

Aerating may be needed once or twice a year, depending on the amount of foot traffic on the grassy areas. Aeration is beneficial for establishment and maintenance of grasses. See the Routine Landscape Maintenance Recommendations in the Canoe Camp section for a description of aeration benefits and procedures.

SUMMARY

The most important part of maintaining this site is to control the encroachment of new nonnative species and prevent the spread of noxious species and undesirable plants. The best control of noxious or invasive species is to use all methods of available control. This site, however, lacks large areas of invasive species making the use of biocontrol insects or herbicides less cost effective. Herbicides used for weed control are unsuitable in areas near waterways or desirable plants, so manual weed removal should be used. To be effective, manual removal will need to be done biweekly, and the site will have to be monitored to catch any new infestations of unwanted species.

This site has very few problem species, and regular observations along with plant removal will keep the invasive species under control. Site use by visitors and dry weather has caused vegetation in some areas to be sparse. These areas should be overseeded with native grasses to prevent establishment of invasive species.

Minimum maintenance procedures should be used at this site to enhance its appearance. Mowing should be minimized so that most of the site appears mostly untouched. By using all methods of noxious plant control and replanting native grasses in sparse vegetation areas, the site will have a more natural appearance and should be appealing to visitors.

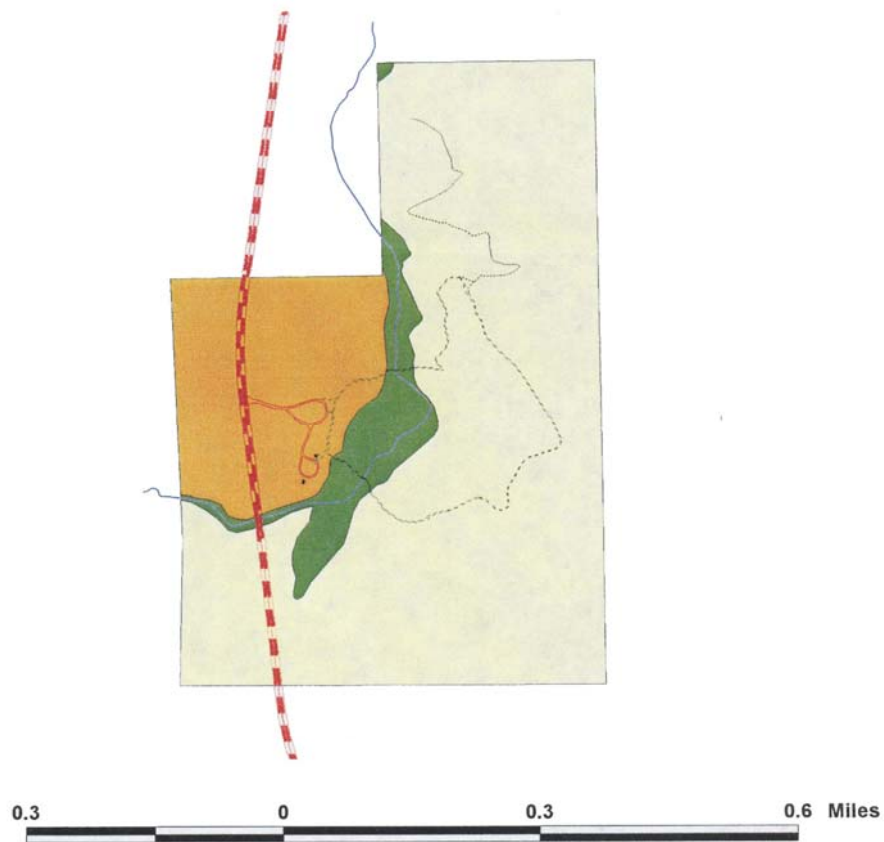
VEGETATION COMPOSITION

Bear Paw Battlefield	Blaine County	Chinook, Montana	
Common name	Scientific name	Native/ nonnative	Abundance
Alfalfa	<i>Medicago sativa</i>	nonnative	occasional
Alpine daisy	<i>Townsendia</i> sp.	native	uncommon
Arnica	<i>Arnica cordifolia</i>	native	uncommon
Beardtongue	<i>Penstemon</i> sp.	native	uncommon
Blanketflower	<i>Gaillardia aristata</i>	native	uncommon
Blue flax	<i>Linum perenne</i>	native	occasional
Blue-eyed grass	<i>Sisyrinchium montanum</i>	native	uncommon
Blue grama	<i>Bouteloua gracilis</i>	native	occasional
Box elder	<i>Acer negundo</i>	native	uncommon
Buckwheat	<i>Eriogonum</i> sp.	native	occasional
Buffalo plum locoweed	<i>Astragalus crassicaeripus</i>	native	uncommon
Buttercup	<i>Ranunculus</i> sp.	native	uncommon
Canada milkvetch	<i>Astragalus canadensis</i>	native	occasional
Canada thistle	<i>Cirsium arvense</i>	nonnative	occasional
Cattail	<i>Typha latifolia</i>	native	occasional
Chickweed	<i>Cerastium arvense</i>	nonnative	occasional
Cottonwood	<i>Populus</i> sp.	native	uncommon
Crested wheatgrass	<i>Agropyron cristatum</i>	nonnative	common
Curly dock	<i>Rumex crispus</i>	nonnative	occasional
Curlycup gumplant	<i>Grindelia squarrosa</i>	native	occasional
Death camas	<i>Zygadenus gramineus</i>	native	occasional
Elk thistle	<i>Cirsium scariosum</i>	native	occasional

Evening primrose	<i>Oenothera biennis</i>	native	occasional
Field bindweed	<i>Convolvulus arvensis</i>	nonnative	occasional
Field morning glory	<i>Convolvulus</i> sp.	nonnative	occasional
Fuzzy plantain	<i>Plantago eriopoda</i>	native	occasional
Gayfeather	<i>Liatris punctata</i>	native	occasional
Green rabbitbrush	<i>Chrysothamnus</i> <i>viscidiflorus</i>	native	uncommon
Giant sunflower	<i>Helianthus giganteus</i>	native	occasional
Goldenweed	<i>Haplopappus armeroides</i>	native	occasional
Harebell	<i>Campanula rotundifolia</i>	native	occasional
Horsetail	<i>Equisetum</i> sp.	native	common
Kochia	<i>Kochia scoparia</i>	nonnative	occasional
Low goldenrod	<i>Solidago missouriensis</i>	native	occasional
Milkweed	<i>Asclepias speciosa</i>	native	occasional
Needle and thread	<i>Stipa comata</i>	native	common
Nodding onion	<i>Allium Cernuum</i>	native	occasional
Oat	<i>Avena</i> sp.	nonnative	occasional
Pasture sage	<i>Artemisia frigida</i>	native	occasional
Pennycress mustard	<i>Thlaspi arvense</i>	nonnative	occasional
Pincushion cactus	<i>Mamillaria vivipara</i>	native	uncommon
Pinesap	<i>Hypopitys monotropa</i>	native	uncommon
Plains daisy	<i>Erigeron engelmannii</i>	native	occasional
Prairie coneflower	<i>Ratibida columifera</i>	native	occasional
Prairie junegrass	<i>Koeleria cristata</i>	native	occasional
Prairie lupine	<i>Lupinus wyethii</i>	native	common
Prairie sage	<i>Artemisia ludoviciana</i>	native	occasional
Prickly lettuce	<i>Lactuca serriola</i>	nonnative	occasional
Prickly pear	<i>Opuntia polyacantha</i>	native	occasional
Prickly rose	<i>Rosa acicularis</i>	native	common
Purple prairie clover	<i>Petalostemon</i> <i>purpureum</i>	native	occasional
Red osier dogwood	<i>Cornus stolonifera</i>	native	occasional
Reed canarygrass	<i>Phalaris arundinacea</i>	nonnative	occasional
Rush skeleton-weed	<i>Chondrilla juncea</i>	nonnative	occasional
Russian thistle	<i>Salsola kali</i>	nonnative	uncommon
Sandberg bluegrass	<i>Poa sandbergii</i>	native	occasional
Scarlet gaura	<i>Gaura coccinea</i>	native	occasional
Scarlet globemallow	<i>Sphaeralcea coccinea</i>	native	occasional
Scorched penstemon	<i>Penstemon deustus</i>	native	occasional
Smooth brome grass	<i>Bromus inermis</i>	nonnative	common
Snowberry	<i>Symphoricarpos alba</i>	native	occasional
Stiff goldenrod	<i>Solidago rigida</i>	native	occasional
Stinging nettle	<i>Urtica dioica</i>	native	uncommon
Sweet clover	<i>Melilotus</i> spp.	nonnative	common

Thickspike wheatgrass	<i>Agropyron dasystachyum</i>	native	occasional
Vetch	<i>Hedysarum</i> sp.	nonnative	occasional
White prairie clover	<i>Petalostemon candidum</i>	native	occasional
White stemmed primrose	<i>Oenothera pallida</i>	native	occasional
Wild bergamot	<i>Monardia fistulosa</i>	native	occasional
Willow	<i>Salix</i> sp.	native	common
Wooly pussytoes	<i>Antennaria lanata</i>	native	occasional
Yarrow	<i>Achillea millefolium</i>	nonnative	occasional

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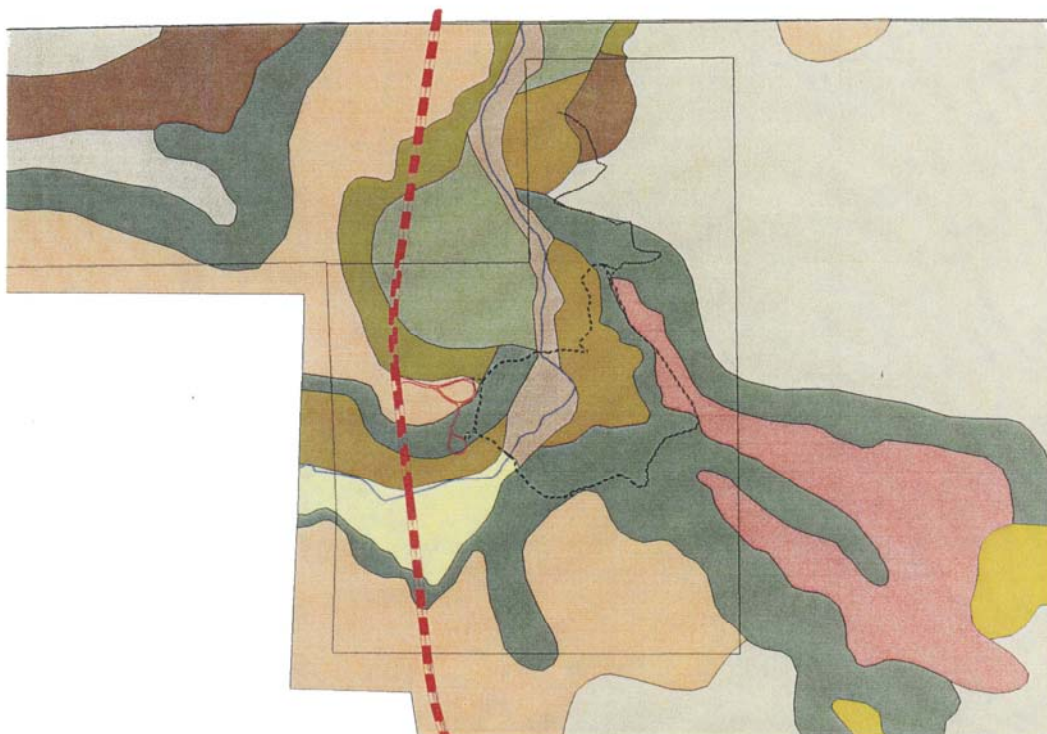


- Roads & Trails**
- Main Loop
 - Death's Point of Rocks
 - County Hwy 240
 - Park Road
 - Hydrology
- Vegetation Management Areas**
- Area 1
 - Area 2
 - Area 3



Bear Paw Battlefield Vegetation Management Areas

Nez Perce National Historical Park GIS - 2002



0.2 0 0.2 0.4 Miles

- Roads & Trails**
- Main Loop
 - Death's Point of Rocks
- County Hwy 240**
- Park Road**
- Hydrology**
- Park Boundary**
- Soils.shp**
- Bearpaw clay loam, 0-4% slope
 - Bearpaw-Elloam clay loam, 0-4% slope
 - Bearpaw-Elloam clay loam, 4-8% slope
 - Bearpaw-Vida clay loam, 0-4% slope
 - Bearpaw-Vida clay loam, 4-8% slope
 - Famuf loam, 2-4% slope
 - Korent-Nesda complex, occ. flooded
 - Straw-Korent loam
 - Typic Ustifluvents, wet
 - Vida-Zahill clay loam, 8-15% slope
 - Zahill clay loam, 25-45% slope
 - Zahill-Vida clay loam, 15-35% slope



Bear Paw Battlefield Soils

Nez Perce National Historical Park GIS - 2002

BIG HOLE NATIONAL BATTLEFIELD, BEAVERHEAD COUNTY; WISDOM, MONTANA

SITE DESCRIPTION

OVERVIEW

Big Hole National Battlefield is 10 miles west of Wisdom, Montana, on Montana Highway 43. This 655-acre unit is owned and managed by the National Park Service and is the place where Col. John Gibbon's forces overran the Nez Perce at their camp next to the Big Hole River. The site has three short hiking trails. One trail leads from the lower parking area to the location of the Nez Perce camp at the time of Gibbon's attack. The second trail leads to the siege area where the Nez Perce forced the soldiers to take refuge. The third trail leads to a site on the mountainside overlooking the scene where the prolonged battle took place and is where the U.S. Army had placed a 12-pound mountain howitzer. The Big Hole Battlefield Visitor Center primarily interprets the Big Hole Battle and the War of 1877. Wayside exhibits and battlefield markers supply additional battlefield details. The Nez Perce, Flathead and Kootenai-Salish Tribes traditionally used this area

Ranching operations and the Beaverhead National Forest surround this unit of the national park system. The site retains much of the character it had in 1877. The few visual intrusions are the National Park Service Visitor Center and housing as well as several ranch outbuildings in the distance. Private land use in the vicinity is for agriculture, primarily cattle grazing. Irrigation canals built in the late 1800s are maintained for water rights owned by adjacent landowners. As an addition to the 655 acres now in federal ownership, 355 acres along the east boundary are being appraised for NPS acquisition in cooperation with the landowner.

NPS visitor and operational facilities at the battlefield are a Visitor Center, five residential structures (providing ten living units), a water treatment plant, a picnic area, interpretive trails, and parking lots. Minor roads are used for internal circulation. As a separate unit of the national park system, Big Hole Battlefield receives administrative support and management oversight from Nez Perce National Historical Park headquarters in Spalding, Idaho. The battlefield is a site along the Nez Perce (Nee-Me-Poo) National Historic Trail, and the National Park Service works closely with the Forest Service in managing and interpreting associated resources.

MANAGEMENT OBJECTIVE FOR BIG HOLE NATIONAL BATTLEFIELD

SITE MANAGEMENT OBJECTIVE

In keeping with the General Management Plan (National Park Service, 1997), the Big Hole Battlefield has three zones with objectives for each one. These are as follows:

- The *historic zone* will be managed to approximate natural conditions and includes the majority of the battlefield, with the exception of the developed and special use zones that follow.
- The *developed zone* will be managed in a natural condition while maintaining a well kept, park-like atmosphere and includes the Visitor Center, maintenance buildings, residences, parking lots, access and circulation roads, and the sewage treatment facility.
- The *special use zone* will be managed in as natural condition as possible and consists of irrigation facilities.

VEGETATION COMPOSITION

The vegetation consists of a sagebrush bench, grass/willow riparian areas and wetlands, sandy hillsides and coniferous forest. The Visitor's Center as well as the other residences and buildings are on the sagebrush bench (area 6). This area has been disturbed by construction. Various native and introduced lawn grass species intermixed with plantain (*Plantago major* and *P. lanceolata*), mallow (*Malva neglecta*), knotweed (*Polygonum* sp.), dandelion (*Taraxacum officinale*), foxtail barley (*Hordeum jubatum*) and timothy (*Phleum pratense*) make up the yard and lawn around these buildings. Although these grasses have been mowed and identification is difficult, the floristic study of the battlefield area by John Pierce (1974) lists several species as being found on the bench (area 6). Some of the native grasses present are bluebunch wheatgrass (*Agropyron spicatum*), Idaho fescue (*Festuca idahoensis*), slender wheatgrass (*Agropyron caninum*), giant wildrye (*Elymus cinereus*), prairie Junegrass (*Koeleria cristata*) and pale-leaved bluegrass (*Poa glaucifolia*). Nonnative grasses also listed that may be present include smooth brome (*Bromus enermis*), crested wheatgrass (*Agropyron cristatum*), red top bentgrass (*Agrostis alba*), meadow fescue (*Festuca pratensis*) and fowl bluegrass (*Poa palustris*).

The bench area (area 6) is dry, and the soil is somewhat sandy so the grasses are sparse allowing bare soil for invasive species to move in. Knapweed (*Centaurea maculosa*) is the most important species to control, and it is found along the roadside as well as dandelion, mallow, groundsel (*Senecio* sp.) and yellow sweet clover (*Melilotus officinalis*) (all areas along roads). Big sage (*Artemisia tridentata*), buckwheat (*Eriogonum umbellatum*), evening-primrose (*Oenothera* sp.), low pussy-toes

(*Antennaria dimorpha*), gray and green rabbit-brush (*Chrysothamnus nauseosus* and *C. viscidiflorus*), large-leaved avens (*Geum macrophyllum*) and lomatium (*Lomatium* sp.) are some native species present.

The riparian and wetland areas (areas 3 and 4) are in the center of the site and adjacent to the North Fork of the Big Hole River, which runs from southwest to northeast. Willow (*Salix* sp.), cottonwood (*Populus* sp.) and quaking aspen (*Populus tremuloides*) make up most of the trees in the area. Mannagrass (*Glyceria* sp.), sedge (*Carex* sp.), rush (*Juncus* sp.), cattail (*Typha latifolia*), fireweed (*Epilobium angustifolium*), golden currant (*Ribes aureum*), snowberry (*Symphoricarpos albus.*), iris (*Iris* sp.) and various other wetland species are found in this area. Camas (*Camassia quamash*), elk thistle (*Cirsium scariosum*), mountain bistort (*Polygonum bistortoides*), buttercup (*Ranunculus* sp) and iris are found in the surrounding meadow intermixed with various grasses, rushes and sedges (area 4). Area 4 is a wetland northwest of the trail to the campsite and somewhat drier meadows are southeast of the trail.

The sandy hillside (area 2) has a diverse mix of dry, open exposure species, such as arrowleaf balsamroot (*Balsamorhiza sagittata*), buckwheat, low pussy toes, sage, rabbit-brush, lomatium, creeping Oregon grape (*Mahonia repens*), lupine (*Lupinus* sp.), owl clover (*Orthocarpus tenuifolius*), paintbrush (*Castilleja* sp.), shooting star (*Dodecatheon pulchellum*) and goldenrod (*Solidago* sp.).

The coniferous forest (area 1) consists of lodgepole pine (*Pinus contorta*), ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), various huckleberry species (*Vaccinium* spp.) and snowberry. Fire suppression has allowed the lodgepole pine to grow thick and dense, creating a monotypic canopy that limits the

understory vegetation. A small stream runs southeast through the forest in the ravine, which has such native plants as currant (*Ribes* sp.), buttercup, paintbrush (*Castilleja* sp.), horsetail (*Equisetum arvense*), sedge, and rush. The density of the forest could be a fire hazard and may be detrimental to the health of the trees. The area between the Visitor Center and the lower parking lot (area 5) has irrigation canals running through the site, and canal leaks have created a water source for vegetation such as willow to grow in unnatural places. This site has very few problem species and is in a fairly natural condition.

The floristic study done by Pierce (1974) lists species documented in 1974. The plant list at the end of this section is for species that were observed in 1999 and is not intended to be a complete species documentation.

SOIL SURVEY INFORMATION

The soil survey for this site is currently being compiled. The survey is will require three years to map the Big Hole Valley (Berger, 2001). Unfortunately, the study was started at the southern end of the valley, and the battlefield is in the northern portion. The annual precipitation ranges from 12 to 14 inches in the town of Wisdom and has been recorded as high as 18 inches at the battlefield. The growing season is only about 30 days in Wisdom, limiting vegetation to short season plants (Berger, 2001). The short season and dry climate could contribute to the sparse vegetation in some areas.

LANDSCAPE PLAN

RECOMMENDATIONS FOR CONTROL OF NOXIOUS PLANTS

The species considered to be most noxious on this site is spotted knapweed, and others that could become a problem are yellow sweet clover, dandelion, mallow and

knotweed. The principle method to control spotted knapweed here should be manual removal to protect the other species that are native in the area. Mechanical removal by hand pulling or hoeing is effective but needs to be done monthly to get the sprouts from pieces of root left in the ground or newly germinated seeds.

Biocontrol insects that are available for spotted knapweed are seed head weevils (*Larinus minutus* and *L. obtusus*), seed head moths (*Metzneria paucipunctella*) and seed head gall flies (*Urophora affinis* and *U. quadrfaciata*) (Wilson, 2001). Various root feeders for spotted knapweed are listed in the 2001 Pacific Northwest Weed Control Handbook (William et al., 2001) and could be investigated for use at this site. However, biocontrol insect use here would probably be inefficient due to the limited areas of the host plant. These biocontrol insects are available if an infestation of spotted knapweed should become invasive.

Herbicides could be used but may kill desirable plants and expose more soil for other invasive species to move in. Spot treating along the roadside can help reduce the spread of invasive species such as spotted knapweed, dandelion, plantain and groundsel. For herbicide formulations that control these species, consult the current Pacific Northwest Weed Control Handbook (William et al., 2001). Common groundsel has shown resistance to some herbicides, however, 2,4-D™ is effective for plantains in turf. Regular monthly observations of the site during the growing season should be made, and these unwanted plants should be pulled and bagged for disposal to prevent seeds from being released into disturbed soil.

REVEGETATION RECOMMENDATIONS

As unwanted plants are removed from areas 5 and 6, native species should be planted in the bare areas to cover any exposed soil. The recreational lawn areas around the visitor center and site residences should be revegetated using native species so these areas will appear more natural (area 6). The seed mixture that should be used in this area is Grass Seed Mixture #5 (see Appendix A), applied at a rate of 15 to 20 lb. per acre. The mixture could be broadcast over the existing vegetation, and this rate can be doubled on steeper terrain (Mustoe, 2001).

Other native species such as scarlet gilia (*Gilia aggregata*), shooting star (*Dodecatheon pulchellum*), arrowleaf balsamroot, large-leaved avens, lupine, lomatium, yampah and kinnikinnick (*Arctostaphylos uva-ursi*) are present on the site and could be propagated for use in other locations at the site (areas 3 & 4). In addition, these species could be added into areas where old trails have been reclaimed to help discourage use (areas 1 & 2).

The eroded areas on the hillside near the intersection of the pathways (area 2) could be planted with kinnikinnick and shrubby cinquefoil (*Potentilla fruticosa*) to help control erosion. Any of the species mentioned previously could also be incorporated here to create a diverse natural appearance. The Plant Material Center (PMC) (Plant Materials Center NRCS, 2001) could be a source for more information on native species used for erosion control.

Natural islands of native trees and shrubs should provide privacy screening for the residents as well as provide an appealing entrance to the site. The north and northwest sides of the residences facing the battlefield area should have several

plantings of trees, shrubs and forbs to screen them from the Visitor's Center (area 6). Several species are present on the site and could be propagated for use in these areas. Quaking aspen, cottonwood, serviceberry, big sage, snowberry, creeping Oregon grape, and black twin-berry (*Lonicera involucrata*) are some of the trees and shrubs that can be grown from cuttings or seeds. For more information on propagation techniques see Propagation of Pacific Northwest Native Plants (Rose et al., 1998). Commercially available native plants that are adapted to dry conditions should be used.

The most important landscape concept to keep in mind is to make sure disturbed ground is covered with some native species to prevent unwanted invasive species from colonizing. Planting a diversity of plants will enhance the appearance of the site and minimize maintenance.

HAZARD TREE RECOMMENDATIONS

All of the trees within close proximity of the trails need to be checked at least annually for dead or damaged limbs. This procedure will be important in all areas of the park to ensure the safety of the visitors and employees. Several trees along the trail to the howitzer site are potentially hazardous and should be monitored closely and removed as needed. The trees should be checked for conks, fungal fruiting bodies, growing on them, which indicates that decay organisms are growing within the trees. Trees that have structurally weak limbs or lack proper care (e.g., pruning) should be pruned to improve their health. A certified arborist should be contracted once a year to examine trees on the site. The arborist should examine trees in questionable health to ensure they are structurally sound and to minimize the hazards of falling limbs and trunks.

ROUTINE LANDSCAPE MAINTENANCE RECOMMENDATIONS

Mowing around buildings (area 6) should be minimal and used mainly for firebreak purposes. Mowing should be done preferably only after seeds have been set to allow the grasses to become better established. Mowing height should be not shorter than six inches. Mowing once a year may be sufficient, and in years with higher than average rainfall mowing twice a year may be needed.

A narrow strip three to four feet wide along the trail to the campsite (area 4) should be mowed no shorter than six inches. This narrow strip is the only area at the site where mowing is recommended, and this strip should only be mowed once per year. Due to the considerable foot traffic along this trail, annual soil aeration would also be beneficial for the grasses and other plants growing beside it. See the Routine Landscape Maintenance Recommendations in the Canoe Camp section for a description of aeration benefits and procedures.

SUMMARY

The most important part of preserving this site is to maintain the native plant species and the cultural scenery without intrusive landscaping procedures. One part of maintaining this site is to control the nonnative species and undesirable plants. Manual removal of unwanted species would be the safest and most effective method to use if chemical control methods are undesirable for use. To be effective, manual removal will need to be done biweekly. Herbicide use should be limited especially near waterways or plants that are desirable. Biocontrol insects are also valuable tools and some may already be established on the site. This site has very few problem plant species, and monthly observations should keep the invasive species under control.

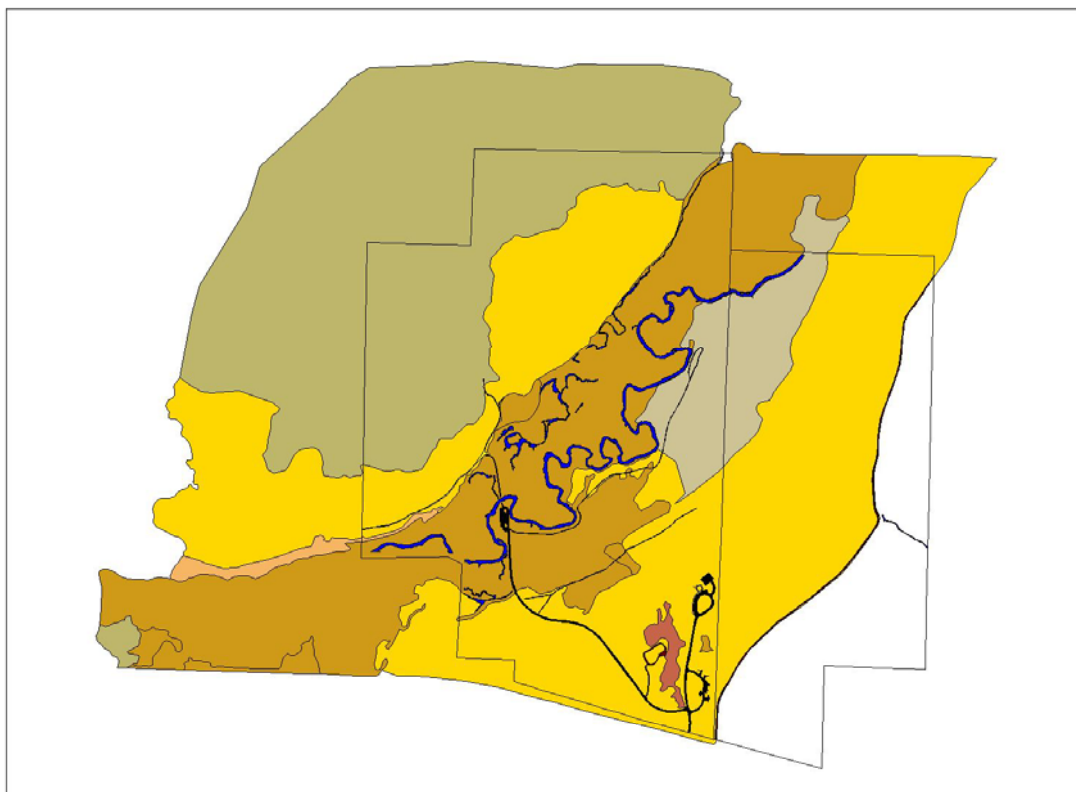
Another part of maintaining this site is to minimize mowing, restricting mowing to areas along the trail to the campsite and around the Visitor's Center and residences. Mowing should be done only once a year in these areas. Planting disturbed areas with native grasses, forbs, shrubs and trees will also reduce needs for intrusive landscape maintenance practices. Finally, planting some native shrub and tree species near the Visitor's Center and residences will help to screen them from view and enhance the cultural scenery for visitors. By using landscape practices that enhance native plant growth, using all methods of noxious plant control, replanting with native species, and installing several mass plantings of trees and shrubs, the site will have a more natural appearance and should be appealing to visitors.

VEGETATION COMPOSITION

Big Hole National Battlefield	Beaverhead County	Big Hole, Montana	
Common name	Scientific name	Native/nonnative	Abundance
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	native	occasional
Aster	<i>Aster scopulorum</i>	native	common
Bellflower	<i>Campanula parryi</i>	native	occasional
Big sage	<i>Artemisia tridentata</i>	native	occasional
Black twin-berry	<i>Lonicera involucrata</i>	native	occasional
Bog lily	<i>Tofieldia glutinosa</i>	native	occasional
Broad-leaf plantain	<i>Plantago major</i>	nonnative	occasional
Buckhorn plantain	<i>Plantago lanceolata</i>	nonnative	occasional
Buckwheat	<i>Eriogonum umbellatum</i>	native	occasional
Buttercup	<i>Ranunculus</i> sp.	native	occasional
Camas	<i>Camassia quamash</i>	native	common
Cattail	<i>Typha latifolia</i>	native	occasional
Cherry	<i>Prunus</i> sp.	native	occasional
Cottonwood	<i>Populus</i> sp.	nonnative	occasional
Creeping Oregon grape	<i>Mahonia repens</i>	native	occasional
Curly dock	<i>Rumex crispus</i>	nonnative	occasional
Dandelion	<i>Taraxacum officinale</i>	nonnative	occasional
Douglas fir	<i>Pseudotsuga menziesii</i>	native	occasional
Elk thistle	<i>Cirsium scariosum</i>	native	occasional

Evening-primrose	<i>Oenothera</i> sp.	native	occasional
Field horsetail	<i>Equisetum arvense</i>	native	occasional
Field pennycress	<i>Thlaspi arvense</i>	nonnative	occasional
Fireweed	<i>Epilobium angustifolium</i>	nonnative	occasional
Foxtail barley	<i>Hordeum jubatum</i>	native	occasional
Golden currant	<i>Ribes aureum</i>	native	occasional
Gray rabbit-brush	<i>Chrysothamnus nauseosus</i>	native	occasional
Green rabbit-brush	<i>Chrysothamnus viscidiflorus</i>	native	occasional
Gromwell	<i>Lithospermum ruderales</i>	native	occasional
Hawksbeard	<i>Crepis intermedia</i>	native	common
Huckleberry	<i>Vaccinium</i> spp.	native	occasional
Idaho fescue	<i>Festuca idahoensis</i>	native	common
Intermediate wheatgrass	<i>Agropyron intermedium</i>	nonnative	common
Iris	<i>Iris</i> sp.	native	occasional
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	native	occasional
Knotweed	<i>Polygonum</i> sp.	nonnative	occasional
Large-leaved avens	<i>Geum macrophyllum</i>	native	occasional
Lodgepole pine	<i>Pinus contorta</i>	native	common
Lomatium	<i>Lomatium</i> sp.	native	occasional
Low pussy-toes	<i>Antennaria dimorpha</i>	native	occasional
Lupine	<i>Lupinus</i> sp.	native	common
Mallow	<i>Malva neglecta</i>	nonnative	occasional
Mannagrass	<i>Glyceria</i> sp.	native	common
Mountain bistort	<i>Polygonum bistortoides</i>	native	occasional
Mullein	<i>Verbascum thapsus</i>	nonnative	occasional
Mustard	<i>Brassica</i> spp.	nonnative	occasional
Needlegrass	<i>Stipa</i> sp.	native	occasional
Owl clover	<i>Orthocarpus tenuifolius</i>	native	occasional
Pipsissewa	<i>Chimaphila umbellata</i>	native	occasional
Ponderosa pine	<i>Pinus ponderosa</i>	native	occasional
Prairie smoke	<i>Geum triflorum</i>	native	occasional
Purple violet	<i>Viola</i> sp.	native	occasional
Quaking aspen	<i>Populus tremuloides</i>	native	occasional
Red fescue	<i>Festuca rubra</i>	nonnative	occasional
Red paintbrush	<i>Castilleja</i> sp.	native	occasional
Rigid fiddleneck	<i>Amsinckia retrorsa</i>	native	occasional
Rose	<i>Rosa</i> sp.	native	common
Rush	<i>Juncus</i> sp.	native	common
Salsify	<i>Tragopogon dubius</i>	nonnative	occasional
Scarlet gilia	<i>Gilia aggregata</i>	native	occasional
Sedge	<i>Carex</i> sp.	native	occasional

Serviceberry	<i>Amelanchier</i> sp.	native	occasional
Shooting star	<i>Dodecatheon pulchellum</i>	native	occasional
Shrubby cinquefoil	<i>Potentilla fruticosa</i>	native	occasional
Small-flowered fiddleneck	<i>Amsinckia menziesii</i>	native	common
Smooth goldenrod	<i>Solidago gigantea</i>	native	occasional
Snowberry	<i>Symphoricarpos albus</i>	native	occasional
Spotted knapweed	<i>Centaurea maculosa</i>	nonnative	common
Sticky cinquefoil	<i>Potentilla glandulosa</i>	native	common
Sticky geranium	<i>Geranium viscosissimum</i>	native	occasional
Stiff sage	<i>Artemisia rigida</i>	native	occasional
Sulfur paintbrush	<i>Castilleja sulphurea</i>	native	occasional
Tall pussy-toes	<i>Antennaria anaphaloides</i>	native	occasional
Tansymustard	<i>Descurainia pinata</i>	nonnative	occasional
Timothy	<i>Phleum pratense</i>	nonnative	occasional
Velvety goldenrod	<i>Solidago mollis</i>	native	occasional
Western meadowrue	<i>Thalictrum occidentale</i>	native	uncommon
Wheat	<i>Triticum</i> sp.	nonnative	occasional
White clover	<i>Trifolium repens</i>	nonnative	occasional
Willow	<i>Salix</i> sp.	native	common
Woods strawberry	<i>Fragaria vesca</i>	native	occasional
Woolly sunflower	<i>Eriophyllum lanatum</i>	native	occasional
Woolly verbena	<i>Verbena stricta</i>	native	occasional
Yampah	<i>Perideridia oregana</i>	native	occasional
Yarrow	<i>Achillea millefolium</i>	native	occasional
Yellow prairie violet	<i>Viola nuttallii</i>	native	uncommon
Yellow sweet clover	<i>Melilotus officinalis</i>	nonnative	occasional



0.5 0 0.5 1 Miles

Hydrology

North Fork

Roads

Asphalt

Dirt roads

Trails

Canal access

Boundary

Big Hole Vegetation

Aspen/Lodgepole

Grass/Sagebrush

Lodgepole

Lodgepole/roadcu

Sedge/Carex

Willow



Big Hole National Battlefield Vegetation

OREGON / WASHINGTON UNIT

OLD CHIEF JOSEPH GRAVESITE, WALLOWA COUNTY; JOSEPH, OREGON

SITE DESCRIPTION

OVERVIEW

Old Chief Joseph Gravesite is on a thirteen-acre parcel that includes a 5.2-acre cemetery on the west side of Highway 82, just north of Wallowa Lake and one mile south of Joseph, Oregon. Old Chief Joseph was reinterred at this site in 1926. This site is one of the thirty-eight historic sites of Nez Perce National Historical Park (NEPE) and marks the beginning of the Nez Perce Trail. When facing the site from the highway, the lake is to the south, and beyond the lake are the Wallowa Mountains and the Eagle Cap Wilderness. Farther to the southeast is an imposing glacial moraine that is protected by a viewshed restriction that prevents building on it (Wallowa County Planning Department, 2001).

The cemetery is a sacred and sensitive area for the Nez Perce people and is also a National Historic Landmark. Old Chief Joseph's grave is marked by a tall stone marker bearing the inscription, "To the Memory of Old Chief Joseph, Died 1870." From 1938 to 1940, the Umatilla Tribal Civilian Conservation Corps (CCC) built a cobble wall and gateposts at the pedestrian entrance. An area for pullout parking, which borders the highway is quite narrow, and the highway is a busy road. Looking at the site from the road, the lake outlet stream is at the back of the site, and the mountains come down to join the stream on the far side (west of area 4). To the north of the original site is the newest addition to the park property, an eight-acre buffer zone that was a pasture (area 2). The acquisition of this property should help protect the cultural resource of the

monument site. The cemetery is held in trust by the Bureau of Indian Affairs for the Umatilla and Nez Perce Tribes. Nez Perce National Historical Park, in consultation with the tribes, administers the land.

MANAGEMENT OBJECTIVE FOR OLD CHIEF JOSEPH GRAVESITE

SITE MANAGEMENT OBJECTIVE

In keeping with the General Management Plan (National Park Service, 1997), the Old Chief Joseph Gravesite has one zone with an objective for its management. The objective is as follows:

- The entire site is to be managed as a *historic zone* so that it is returned to natural conditions as much as possible.

VEGETATION COMPOSITION

The vegetation of the site consists mainly of grasses, some small trees and shrubs, and a few large ponderosa pines (*Pinus ponderosa*). A small area around the monument is a maintained lawn of mixed nonnative grass and broadleaf species such as dandelion (*Taraxacum officinale*), plantain (*Plantago* spp.), and hound's tongue (*Cynoglossum officinale*) (area 1). The native grasses in the area mainly consist of Idaho fescue (*Festuca idahoensis*), prairie Junegrass (*Koeleria cristata*), and giant wildrye (*Elymus cinereus*). Cheatgrass (*Bromus* spp.), barnyard grass (*Echinochloa crusgalli*), fescue (*Festuca* spp.) and timothy (*Phleum pratense*) are nonnative species of grasses intermixed in this area. The grasses in the pasture (area 2) are the result of longstanding grazing practices and consist of species similar to those mentioned previously.

Herbaceous species present in both areas 1 and 2 include lomatium (*Lomatium* sp.), yampah (*Perideridia gairdneri*), gromwell (*Lithospermum ruderale*), lupine (*Lupinus* sp.) and arrowleaf balsamroot (*Balsamorhiza sagittata*) are all native species. Native trees and shrubs at the site include serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos albus*), oceanspray (*Holodiscus discolor*), hawthorn (*Crataegus* sp.), creeping Oregon grape (*Mahonia repens*), and ponderosa pine (all areas). A few landscape plants are established such as lilac (*Syringa vulgaris*), iris (*Iris* sp.) and potentilla (*Potentilla fruticosa*) (area 1). A list of other plant species, their relative abundance and native or nonnative status are listed. Native Americans traditionally used some of the native plant species present at the site. Native species currently present at the site should be preserved, protected and encouraged to grow. The vegetation at the site is in fairly good balance at this time. No single species appears dominant. Noxious species can be kept in check with minimal maintenance if these species are monitored monthly and control measures are taken.

SOIL SURVEY INFORMATION

Three types of soils are present at this site (NRCS, 2001). The first soil is made up of 85% Rondowa silt loam, at 8 to 15% slopes. The remaining 15% are made up of contrasting inclusions. The landscape is slightly concave tops of moraines with a parent material of mixed glacial till with loess and volcanic ash in the surface layers. Native plants mainly consist of Idaho fescue, prairie Junegrass, and hawthorn. The annual precipitation ranges from 17 to 30 inches, and the average air temperature is 42 to 45°F, with a frost-free period of about 70 to 100 days. The soil is fairly deep and well

drained with moderate permeability. The erosion hazard is moderate, and the frost action could cause moderate problems with frost heaving.

The contrasting inclusions are areas with surface stone or cobbles, Hurwal soils on gentle north-facing slopes and areas with less than 35% rock fragments, scattered throughout the slope.

The second soil in this area is Rondowa stony loam at 2 to 15% slopes. This landscape is generally undulating ridge tops, benches, and foot slopes of the moraines. This soil is also well drained and deep with only a slight hazard for erosion. Stones on the surface, cobble layers, water erosion and frost heaving are the main limitations to management of these soils. Frost action limits construction of roads, driveways and buildings.

The third soil in this area is Rondowa stony loam at 30 to 60% slopes. This landscape is south facing side slopes of moraines. This soil is also well-drained and deep with severe hazard for erosion. Stones on the surface, water erosion and slope are the main limitations to management of these soils.

LANDSCAPE PLAN

RECOMMENDATIONS FOR CONTROL OF NOXIOUS PLANTS

Areas throughout the site have some Canada thistle (*Cirsium arvense*), hound's tongue, knapweed (*Centaurea* sp.), and prickly lettuce (*Lactuca serriola*) which could be manually removed monthly to begin controlling the seed source. Gloves should be worn when hand pulling these species due to their sticky thorns and irritating alkaloids. Areas should be spot sprayed with picloram at the label recommended rate, but if uncontrolled, the roots will need to be removed manually.

The area outside the path that encircles the monument and the adjacent pasture should be burned, if possible, to aid native grass regeneration. The burning should take place in the fall with immediate reseeding so new grass plants will emerge in the spring with the aid of moisture from winter snow. The burned area should be monitored for weed emergence as well as possible native grasses. The weeds should be removed manually or, in the case of persistent thistle or knapweed, spot sprayed with picloram until under control. Herbicides of different classes should be used if spraying is necessary in subsequent years.

The area between the roadside parking and the cobblestone wall is about three feet wide (area 3) and is sparsely covered with grasses, asters (*Aster* spp.), prickly lettuce, and some small trees and shrubs. This area should have undesirable species removed, and native grasses and forbs already present need to be protected and encouraged to grow. Removal of nonnative species can be done manually in this strip due to the strip's small size and the presence of some native species. The noxious and undesirable species that could potentially cause problems if uncontrolled are Canada thistle, cheatgrass, dandelion, hound's tongue, knapweed and prickly lettuce.

The maintained lawn (area 1) around the monument is worn in places where people have walked and could be improved with the addition of mulch on the path areas. Mulch around the lilac shrubs would keep the weeds and unwanted grasses out of the bed that surrounds the lawn area. A serviceberry and a potentilla are growing in the bed directly around the stone marker. This bed should be mulched as well. Mulch could be an organic material, such as wood chips, or lava rock if the wood is considered to be a fire hazard. The mulch should be weed-free. If straw is used for mulch, it must

be weed-free to comply with Wallowa County Ordinance 2000 - 2001 Control of spread of noxious weeds in Wallowa County, Oregon (Sherwin, 2002).

REVEGETATION RECOMMENDATIONS

Native species will be used where planting is needed to cover any bare soil created by removal of unwanted species (all areas). The three-foot strip between the wall and roadside parking can be replanted with creeping Oregon grape or bluebunch wheatgrass (*Agropyron spicatum*), which are native and will tolerate a wide range of soil types. Planting some container grown grass plants and sowing seeds will help establish native grasses in this area.

The existing grasses should be overseeded with a native grass seed mixture (see Grass Seed Mixture #1 in Appendix A). This mixture is applied at a rate of 15 to 20 lb. per acre if drill seeding or the rate can be doubled or applied up to 80 lb per acre if hand seeding. The grasses should be sown after the burning in the fall to help to fill in between existing plants and the rates can be doubled on steeper terrain (Mustoe, 2001). The grass mixture recommended includes drought tolerant species that lack a requirement for routine mowing. However, mature native grasses often out-compete most introduced broadleaf plants when mowed to a height of six inches once or twice a year. This minimal mowing will allow the grasses to set seed and be dispersed. Sterile wheatgrasses have been used as nurse crops in addition to the recommended seed mix. Seeds used for straw or hay production must be weed-free to comply with the Wallowa County Ordinance covering straw or hay production (Sherwin, 2002). The site should be monitored monthly for the appearance of new nonnative plants, and manual removal will be necessary until the native grasses are established. All of the native

species planted should tolerate cold temperatures and be adaptable to a wide range of soil types.

The edge of the property that borders the stream is eroding and should be stabilized by planting erosion control grasses, such as streambank wheatgrass (*Agropyron riparium*) and giant wildrye (area 4). All of these are excellent for erosion control due to their massive root systems, and they tolerate the harsh extremes of western weather. Planting established giant wildrye plants in the various impromptu pathways through the property to the stream might help deter future use. Planting several serviceberry, black hawthorn (*Crataegus douglasii*), Wood's rose (*Rosa woodsii*) or oceanspray shrubs along the back of the property bordering the stream may also discourage use of the path (area 4).

The large lilac shrubs that encircle the stone marker should be maintained until they are in poor condition or management decided to revert the area to native vegetation. At that time, these lilacs can be replaced with serviceberry, black hawthorn, or oceanspray (area 1). The health of the lilacs could be improved by pruning any dead or diseased branches. One quarter of the oldest branches could be removed with care at ground level each year to avoid extreme alterations in the size and shape of these large shrubs. This pruning will stimulate new growth from the base and maintain flowering.

HAZARD TREE RECOMMENDATIONS

The term hazard tree refers to a tree that presents some sort of hazard to a person or building. Taking appropriate action is very important in situations that involve the safety of visitors and may present liability. All trees should be assessed on a yearly

basis for broken or hanging limbs. Shrubs should be examined for damaged branches that may be walked into or otherwise endanger a visitor. A few trees need pruning at the site, but one in particular may pose a threat to someone walking under it. On the north side of area 1, a boxelder tree that is mostly dead should be removed. The large ponderosa pines along the wall and next to the parking area need to be monitored for limb damage from high winds and breakage due to heavy snow load (area 3). A certified arborist should be contracted to inspect each tree on the entire site annually for structural integrity and potential hazards.

ROUTINE LANDSCAPE MAINTENANCE RECOMMENDATIONS

The maintenance of this site should be minimal after the initial work of re-vegetating with native species. If the planting is completed in fall, watering will be unnecessary once plants become established. All new transplants should be kept moist until the roots are established. Native species are very adaptable and tolerate extreme climatic conditions. The newly planted grass seeds will need to be kept moist for three to four weeks while germinating. Planting in fall minimizes supplemental watering. Once grass is established, supplemental watering is unnecessary.

The lawn in the circle area should be killed by an application of Roundup™, tilled under, and then re-seeded with Grass Seed Mixture #1 (see Appendix A). This procedure should be completed in fall before snowfall. Mowing this area should be unnecessary, but if mowing is needed it should be completed only once a year in late summer after the seeds have filled out. Native grasses should be mowed at a height of six inches or higher.

Fertilizing should be unnecessary, but if plants display nutrient deficiencies or lack vigor, a soil analysis may be necessary to treat the problem effectively. Pruning was addressed in the hazard tree section, but routine monitoring of all the shrubs and trees should be carried out on an annual basis. To maintain the health of the plants, all broken limbs and dead wood should be removed.

SUMMARY

The goal of managing the landscape at the site is to control of noxious plant species already present and to replant the area with native grasses, shrubs, and trees. Current noxious species can be controlled with monitoring and appropriate control measures. Replanting some areas, particularly the lawn circle with native grasses, should reduce vegetation maintenance requirements. Another goal is to re-seed the slopes near the lake and outlet stream to control soil erosion on the west side of the property. Paths leading to this area should also be seeded. The boxelder at the site is mostly dead and should be removed due to its hazard potential. The ponderosa pines should be evaluated yearly due to their location in highly used areas. Replanting with native species and using the landscape maintenance practices recommended for this site will enhance its natural appearance and should be appealing to visitors.

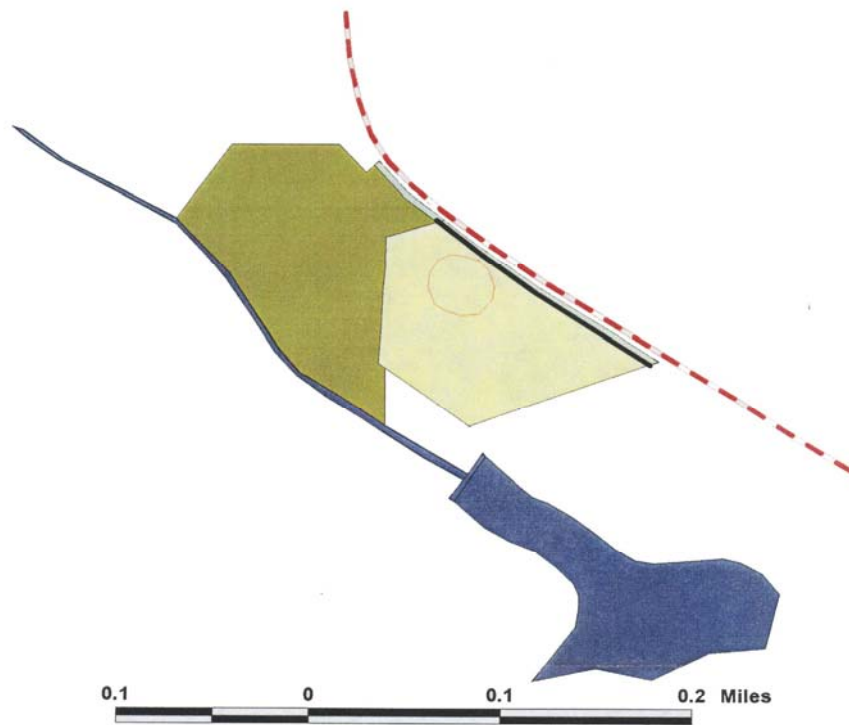
VEGETATION COMPOSITION

Old Joseph Gravesite Wallowa County		Joseph, Oregon	
Common name	Scientific name	Native/nonnative	Abundance
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	native	occasional
Aster	<i>Aster</i> spp.	nonnative	occasional
Barnyard grass	<i>Echinochloa crusgalli</i>	nonnative	occasional
Bedstraw	<i>Galium aparine</i>	nonnative	occasional
Birch	<i>Betula</i> sp.	native	occasional
Black medic	<i>Medicago lupulina</i>	nonnative	occasional

Boxelder	<i>Acer negundo</i>	native	uncommon
Brodiaea	<i>Brodiaea</i> sp.	native	occasional
Buckwheat	<i>Eriogonum</i> sp.	native	uncommon
Canada thistle	<i>Cirsium arvense</i>	nonnative	occasional
Cheatgrass	<i>Bromus</i> spp.	nonnative	occasional
Chokecherry	<i>Prunus virginiana</i>	native	occasional
Creeping Oregon grape	<i>Mahonia repens</i>	native	common
Curly cup gumplant	<i>Grindelia squarrosa</i>	native	uncommon
Currant	<i>Ribes</i> sp.	native	uncommon
Daisy	<i>Chrysanthemum leucanthemum</i>	nonnative	uncommon
Dandelion	<i>Taraxacum officinale</i>	nonnative	uncommon
Giant wildrye	<i>Elymus cinereus</i>	native	occasional
Goldenrod	<i>Solidago</i> sp.	native	occasional
Green rabbitbrush	<i>Chrysothamnus viscidiflorus</i>	native	occasional
Gromwell	<i>Lithospermum ruderae</i>	native	occasional
Hawthorn	<i>Crataegus</i> sp.	native	uncommon
Hound's tongue	<i>Cynoglossum officinale</i>	nonnative	common
Iris	<i>Iris</i> sp.	cultivated	uncommon
Juniper	<i>Juniperus occidentalis</i>	native	uncommon
Lilac	<i>Syringa vulgaris</i>	cultivated	occasional
Lomatium	<i>Lomatium</i> sp.	native	uncommon
Lupine	<i>Lupinus</i> sp.	native	common
Moth mullein	<i>Verbascum blattaria</i>	native	uncommon
Mullein	<i>Verbascum thapsus</i>	native	occasional
Mustard	<i>Brassica</i> spp.	nonnative	occasional
Narrow-leaved plantain	<i>Plantago lanceolata</i>	nonnative	occasional
Oceanspray	<i>Holodiscus discolor</i>	native	uncommon
Plantain	<i>Plantago</i> spp.	nonnative	common
Ponderosa pine	<i>Pinus ponderosa</i>	native	occasional
Potentilla	<i>Potentilla fruticosa</i>	native	uncommon
Prairie Junegrass	<i>Koeleria cristata</i>	native	occasional
Prickly lettuce	<i>Lactuca serriola</i>	nonnative	occasional
Reed canarygrass	<i>Phalaris</i> sp.	nonnative	occasional
Sage	<i>Artemisia</i> sp.	native	occasional
Salsify	<i>Tragopogon pratensis</i>	nonnative	occasional
Serviceberry	<i>Amelanchier alnifolia</i>	native	uncommon
Siberian elm	<i>Ulmus pumila</i> .	nonnative	uncommon
Snowberry	<i>Symphoricarpos albus</i>	native	occasional
Spotted knapweed	<i>Centaurea maculosa</i>	nonnative	uncommon
Stinging nettle	<i>Urtica dioica</i>	native	occasional

Timothy	<i>Phleum pratense</i>	nonnative	common
Wheatgrass	<i>Agropyron</i> spp.	native	occasional
Wild geranium	<i>Geranium maculatum</i>	nonnative	uncommon
Wild rose	<i>Rosa</i> sp.	native	occasional
Yampah	<i>Perideridia gairdneri</i>	native	uncommon
Yarrow	<i>Achillea millefolium</i>	native	occasional

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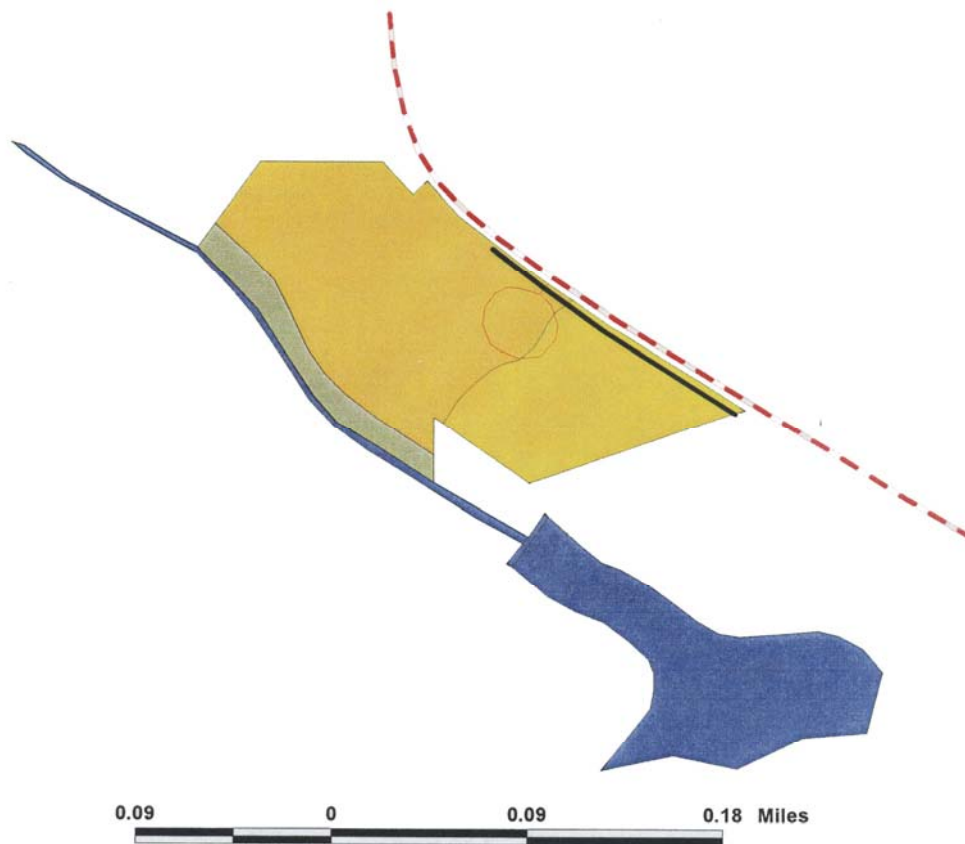


- Roads & Trails**
- Highway 82
 - Park Road
 - Rock Wall
 - Hydrology
- Vegetation Management Areas**
- Area 1
 - Area 2
 - Area 3



Old Chief Joseph Gravesite Vegetation Management Areas

Nez Perce National Historical Park GIS - 2002



- Roads & Trails**
- Highway 82
 - Park Road
 - Rock Wall
 - Hydrology
- Soils**
- Rondowa stony loam, 8-15% slopes
 - Rondowa stony loam, 2-15% slopes
 - Rondowa stony loam, 30-60% slopes



Old Chief Joseph Gravesite Soils

Nez Perce National Historical Park GIS - 2002

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APPENDIX A

GRASS SEED MIXTURES:

Grass Seed Mixture #1

Species Common Name	Species Scientific Name	Percentage of Mixture (% by volume)
Bluebunch wheatgrass	<i>Agropyron spicatum</i>	25
Thick-spiked wheatgrass	<i>Agropyron dasytachyum</i>	15
Idaho fescue	<i>Festuca idahoensis</i>	25
Sandberg bluegrass	<i>Poa sandbergii</i>	15
Sterile wheatgrass	<i>Triticum</i> sp.	20

Grass Seed Mixture #2

Species Common Name	Species Scientific Name	Percentage of Mixture (% by volume)
Bluebunch wheatgrass	<i>Agropyron spicatum</i>	15
Tufted hairgrass	<i>Deschampsia caespitosa</i>	10
Giant wildrye	<i>Elymus cinereus</i>	20
Idaho fescue	<i>Festuca idahoensis</i>	15
Indian ricegrass	<i>Oryzopsis hymenoides</i>	15
Sandberg bluegrass	<i>Poa sandbergii</i>	10
Sterile wheatgrass	<i>Triticum</i> sp.	15

Grass Seed Mixture #3

Species Common Name	Species Scientific Name	Percentage of Mixture (% by volume)
Blue grama	<i>Bouteloua gracilis</i>	25
Idaho fescue	<i>Festuca idahoensis</i>	30
Junegrass	<i>Koeleria cristata</i>	25
Sterile wheatgrass	<i>Triticum</i> sp.	20

Grass Seed Mixture #4

Species Common Name	Species Scientific Name	Percentage of Mixture (% by volume)
Needle and thread	<i>Stipa comata</i>	25
Idaho fescue	<i>Festuca idahoensis</i>	30
Junegrass	<i>Koeleria cristata</i>	25
Sterile wheatgrass	<i>Triticum</i> sp.	20

Grass Seed Mixture #5

Species Common Name	Species Scientific Name	Percentage of Mixture (% by volume)
Slender wheatgrass	<i>Elymus trachycaulus</i>	20
Western wheatgrass	<i>Elymus smithii</i>	40
Thickspike wheatgrass	<i>Elymus macrourus</i>	10
Idaho fescue	<i>Festuca idahoensis</i>	10
Sherman big bluegrass	<i>Poa ampla</i>	10
Mountain brome	<i>Bromus marginatus</i>	10

APPENDIX B

NATIVE PLANT AND SEED SOURCES

IDAHO

Buffalo-Berry Farm 51 East Lake Fork Rd., McCall, ID 83638 (208)634-3062
Clifty View Nursery R.R. 1 Box 509, Bonners Ferry, ID 83805 (208)267-7129
Hash Tree Company 1199 Bear Creek Rd., Princeton ID 83857 (208)875-1000
Jayker Wholesale Nursery 4042 West Chinden, Meridian, ID 83642 (208)887-1790
Lake Creek Seed 15700 S. Idaho Rd., Worley, ID 83876 (509)291-6661
Native Seed Foundation Star Route, Moyie Springs, ID 83845 (208)267-7938
Plantasia Cactus Gardens 867 Filer Ave West, Twin Falls, ID 83301 (208)734-7959
Seed Specialists 568 West Buckles, Hayden Lake, ID (208)762-8308
Seed Trust-High Altitude Gardens P.O. Box 1048, Hailey, ID 83333 (208)788-4363
Silver Springs Nursery HC 62, Box 86, Moyie Springs, ID 83845 (208)267-5753
Trail Creek Nursery, Inc. 18 West 700 South, Victor, ID 83455 (208)787-2470
USDA Plant Materials Center P.O. Box 296, Aberdeen, ID 83210 (208)397-4133
Wildlife Habitat Institute 1025 East Hatter Creek Rd., Princeton, ID 83857 (208)875-1246

MONTANA

Bitterroot Restoration, Inc. 445 Quast Lane, Corvallis, MT 59828 (406)961-4991
Garden City Seeds 778 Hwy. 93 N., Hamilton, MT 59840 (406)961-4837
Grouse Springs Nursery 5853 East Shore Route, Polson, MT 59860 (406)887-2696
Lawyer Nursery, Inc. 950 Hwy. 200 W., Plains, MT 59859 (406)826-3881
Morning Creek Gardens 880 Blackmer Lane, Columbia Falls, MT 59912 (406)756-1971
Nature's Enhancement 2980 Eastside Hwy., Stevensville, MT 59870 (406)777-3560
Valley Nursery 6000 N. Montana Ave., Helena, MT 59604 (406)458-3992
USDA Plant Materials Center Rt. 2 Box 1189, Bridger, MT 59014 (406)662-3579
Wild Flower Seeds 630 Wildlife Lane, Anaconda, MT 59711 (406)563-8048

OREGON

Althouse Nursery 5410 Dick George Rd., Cave Junction, OR 97523 (541)592-2395
Callahan Seeds 6045 Foley Lane, Central Point, OR 97502 (541)855-1164
Emerald Seed & Supply 9330 N.E. Halsey St., Portland, OR 97220 (503)254-8414
Flora Lan Nursery 7940 N.W. Kansas City Rd., Forest Grove, OR 97116 (503)357-8386
Forestfarm 990 Tetherow Rd., Williams, OR 97544 (541)846-7269
Goodwin Creek Gardens P.O. Box 83, Williams, OR 97544 (541)846-7357
Greer Gardens 1280 Goodpasture Island Rd., Eugene, OR 97401 (541)686-8266
Heritage Seedlings, Inc. 4199 75th Ave. S.E., Salem, OR 97301 (503)585-9835
Nature's Garden 40611 Hwy. 226, Scio, OR 97374 (503)394-3217
Nichols Garden Nursery 1190 N. Pacific Hwy. N.E., Albany, OR 97321 (541)928-9280

Oakhill Farms Native Plant Nursery 4314 Goodrich Hwy., Oakland, OR 97462
(541)459-1361
Pacific Northwest Natives 1525 Laurel Heights Dr. N.W., Albany, OR 97321 (541)928-8239
Portland Nursery 5050 S.E. Stark, Portland, OR 97215 (503)231-5050
Rogue House Seed 250 Maple St., Central Point, OR 97502 (541)664-1775
Stone Crop Gardens 1530 Crittenden St. S.W., Albany, OR 97321 (541)928-8652
Trillium Gardens P.O. Box 803, Pleasant Hill, OR 97455 (541)937-3073
USDA Plant Materials Center 3415 N.E. Granger Ave., Corvallis, OR 97330 (541)757-4812
Wichita Nursery, Inc. 9413 S. Heinz Rd., Canby, OR 97013 (503)651-2279

WASHINGTON

Abundant Life Seed Foundation 930 Lawrence St., Port Townsend, WA 98368
(360)385-5660
Burnt Ridge Nursery 432 Burnt Ridge Rd., Onalaska, WA 98570 (360)985-2873
Cloud Mountain Farm 6906 Goodwin Rd., Everson, WA 98247 (360)966-5859
Dutch Tuch Acres 36009 N.E. 31st Ave., LaCenter, WA 98629 (360)263-1505
Foliage Gardens 2003 128th Ave. S.E., Bellevue, WA 98005 (425)747-2998
Grassland West 908 Port Drive, Clarkston, WA 99403 (509)758-9100
Heaths and Heathers 502 E. Haskell Hill Rd., Shelton, WA 98584 (360)427-5318
Heronwood Nursery 7530 288th St. N. E., Kingston, WA 98346 (360)297-4172
Inside Passage P.O. Box 639, Port Townsend, WA 98368 (360)385-6114
Natives Northwest 190 Aldrich Rd., Mossyrock, WA 98564 (360)983-3138
Plants of the Wild P.O. Box 866, Tekoa, WA 99033 (509)284-2848
Rainier Seeds, Inc. 1404 4th St., Davenport, WA 99122 (509)725-1235
Shore Road Nursery 616 Shore Rd., Port Angeles, WA 98362 (360)457-1536
Sun Mountain Native Seeds, 120 N. Wall, Suite 400, Spokane, WA 99201 (800)268-0180
USDA Plant Materials Center P.O. Box 646211, Pullman, WA 99164 (509)335-7376
Wildside Growers 6361 Hannegan Rd., Lynden, WA 98264 (360)398-7158
Woodbrook Nursery 1620 59th Ave. N.W., Gig Harbor, WA 98335 (253)265-6271

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Little Goose Native Plants & Wildflowers 226 Main St., Bighorn, WY 82833 (307)672-5340
Wind River Seed, 3075 Lane 51½, Manderson, WY 82432 (307)568-3361